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TRANSACTIONS,

OF THE

Horticultural Society

OF

LONDON.

Volume VI.

T. Woolnoth Sculpsit.

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PREFACE.

WHEN the last volume of the Transactions was published, it was found necessary to offer an apology to the Fellows of the Society for the delay which had taken place in its completion. It is satisfactory to be able now to state, that the difficulties by which the delay alluded to was caused, are so far removed, that the present volume has been completed within the customary period. It has been published in five separate parts, and contains a large body of *original* Horticultural information; such as it may be safely affirmed is not to be found in any other publication of the same period. Of so great importance indeed has it been esteemed by the public, both at home and abroad, that a very considerable portion of every Foreign and Domestic Journal in which the subject of Horticulture is noticed, derives a large part, and in some cases almost the entire of its interest from Extracts from these Transactions. Among the contributors by whom this information has been supplied, are ranked some of the most philosophical, as well as practical Horticulturists of the day; their number is nearly the same as heretofore.

An entirely novel feature in this Volume has been created by the introduction of Reports from the Society's Garden, upon various subjects which have been investigated in it. These will continue regularly to appear, and will supply the public with the most accurate means of judging of the degree in which the objects of Horticulture are likely to be illustrated by the Establishment of the Garden. It may be confidently stated that these will continue to increase in interest with each succeeding year; and that the results of observations made in the Garden, will fully keep pace with its gradual progress.

The number of Fellows of the Society has advanced from 1915, at the date of the last Preface, to 2044; and the total number of the Society, including Honorary, Foreign, and Corresponding Members, to 2394, the last return having been 2197. In this period a farther accession of European Princes to the list of the Society has taken place; but the Society has to lament the recent loss of the most distinguished of its Honorary Members—His late Royal Highness the Duke of York. The number of the Society has however become so large, that an annual loss of Members from natural causes must now be expected to occur in such a degree as to render it improbable that its absolute increase will continue to be such as it was between the years 1816 and 1824.

It was observed upon a former occasion, that the success of the Horticultural Society must necessarily exercise a most extensive and beneficial influence upon Gardening pursuits

in all parts of the United Kingdom. This is now becoming too apparent to be doubted, and is especially evinced in the organization of provincial Horticultural Associations in every direction, which will undoubtedly produce in detail the same fortunate results within their own districts, as the Parent Society has been enabled to secure by its influence generally. With this impression, and from an anxious desire to hold out assistance and countenance to the efforts of all such bodies, wherever they may exist, the Council of this Society has lately determined to give annually to each local Horticultural Society whose affairs are directed by a President and Council, or Committee, one of their large Silver Medals, to be awarded by the local Society to some one individual in their own district, whose skill in Gardening shall appear to them to be most deserving of the distinction.

In the Preface to the Fifth Volume, it was announced that two Expeditions for the Collection of Plants were in progress at the expence of the Society; one to the Western Coast of South America, and the Sandwich Islands, and the other to the North West Coast of North America.

To the former of these Mr. JAMES M'RAE, an experienced Gardener, was appointed, with the consent of the Lords of the Admiralty. He sailed in September 1824, and returned in March 1826, having successively visited Rio Janeiro, and St. Catherine's in Brazil, several ports on the coast of Chile, and the Sandwich Islands. On his return he landed upon Albemarle Island, one of the Gallipagos, touched at Chorillo

Bay, on the Coast of Peru, and re-visited Chile, when he found an opportunity of reaching Santiago, and botanizing among the little known vegetation of the Cordilleras. Upon this occasion Mr. M'Rae succeeded in procuring a supply of fresh nuts of the highly prized Araucaria Pine, which arrived in England, in a living state, and from which a considerable distribution has already been made by the Society. The collections of seeds and plants of all kinds was very large, and of the greatest value to science. To the Sandwich Islands, this Expedition has produced advantages which it is hoped that those countries will long continue to enjoy, and which may be no inconsiderable means of hastening the civilization of the natives. In addition to a large supply of European fruits and vegetables, Mr. M'Rae succeeded in transplanting in safety most of the valuable productions of the same kind which are found in Brazil. It is gratifying to add, that, since his return, the Right Honourable Earl Bathurst, His Majesty's Colonial Secretary of State, has been pleased, upon the recommendation of the Society, to appoint this meritorious individual to the charge of the important Colonial Garden in Ceylon.

The expedition to the North-west coast of North America, was undertaken under the protection of the Hudson's Bay Company, and was confided to the care of Mr. David Douglas, a zealous and enterprizing young man, who had previously done the Society good service on the Eastern side of the same Continent. Mr. Douglas was expected to have

returned home in the last year, but finding the objects of his research still unexhausted, he has been induced to remain another season; his expedition being therefore still in progress, it will be sufficient for the present, to state that it has hitherto succeeded beyond the most sanguine expectations of his employers. A number of new plants, of the utmost interest to science, and of importance to ornamental gardening, has been discovered, and the seeds of them transmitted to Europe. It is hoped that, from this expedition, our gardens will become as well filled with the beautiful vegetation of the borders of the Columbia, and of the Rocky Mountains, as it is already with that of the Ohio and Mississippi.

It may be proper to add, that no further expedition is at present contemplated by the Society, its extensive correspondence with every accessible country now rendering such a means of procuring Horticultural novelties less important than it has been heretofore.

The Society continues to receive assurances of the utility of its exportations of fruit-trees and vegetable seeds to foreign countries, and acknowledgments of the benefits which have been so conferred upon various distant parts of the world.

The Library has been increased both by purchases and by donations from many members of the Society, and from strangers, and it is hoped that the importance to Horticulture of this part of the Establishment, will be steadily kept in view by friends of the Society. There is at present no other public repository of books upon Gardening which can be

compared to that of the Society, but it must be acknowledged that it is still far from complete.

The Collection of Models of Fruits, which has been forming from the productions of many successive seasons, which has now become by far the most considerable in Europe, and which is absolutely indispensible in any classification or arrangement of many classes of fruit, has lately been disposed in glazed cases fixed in the Meeting Room, where it can be consulted without the inconvenience of examination in close boxes.

The Garden continues to flourish, and improve in its appearance in a degree which cannot but be highly satisfactory. Allusion has already been made to the various Reports from it, which are published in the present Volume; the same spirit of examination and investigation will continue to be maintained, and the chief objects of its institution, the determination of Hardy Fruits, Esculent Vegetables, and Ornamental Trees and Shrubs, and the Exhibition of Horticulture in all its branches, will be steadily followed as far as the means of the Society will admit. Measures which have long been taken for putting the public in possession of the subjects cultivated in the Garden, have now begun to manifest themselves, in the publication of a Catalogue of Fruits. This has been compiled with the utmost care; and with a view to its ultimate perfection in succeeding editions, has been sent to every public Garden and Nurseryman in the United Kingdom, in communication with the Society, in the hope that it may become

a standard of nomenclature. By this distribution, the cultivators of fruit-trees for sale will be enabled to ask for, and obtain, from the Garden of the Society, the kinds they may want, and thus the public generally may be supplied with less uncertainty than heretofore. The private Gardens of the Members of the Society will be also furnished with accuracy from the distributions continually made at the Office of the Society, of the most valuable and important varieties thus publicly named, or by reference to the Garden Committee, to whom is confided the attention to the applications of those Fellows whose Subscriptions to the Garden give them the privilege of making especial calls for such supplies.

Regent Street,
January 20, 1827.

ADVERTISEMENT.

THE Committee appointed by the Horticultural Society to direct the Publication of the Papers read before them, take this opportunity to inform the Public, that the grounds of their choice are, and will continue to be, the importance and singularity of the subjects, or the advantageous manner of treating them, without pretending to answer for the certainty of the facts, or the propriety of the reasonings contained in the several Papers so published, which must still rest on the credit or judgment of their respective Authors.

It is likewise necessary, on this occasion, to remark, that it is an established rule of this Society, to which they will always adhere, never to give their opinion, as a body, upon any subject, either of Nature or Art, that comes before them. And therefore, the thanks which are proposed from the Chair, to be given to the Authors of such Papers as are read at the General Meetings, or to the Persons who send fruits or other vegetable productions, or exhibit Inventions of various kinds to the Society, are to be considered in no other light than as a matter of civility, in return for the respect shewn to the Society by these communications.

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TRANSACTIONS

OF

THE HORTICULTURAL SOCIETY.

I. *On* Climate, considered with regard to Horticulture. *By* John Frederic Daniell, *Esq. F. R. S. &c.*

Read August 17th, 1824.

The following observations were committed to paper, and submitted to the consideration of the Horticultural Society, at the particular request of their Secretary. The author would scarcely have thought them novel or important enough for such a destination, but he defers to his judgment, and shall at all events have had the pleasure of complying with his wishes.

Horticulture differs from Agriculture in one very material respect. The latter has for its object the fertilization of the soil by manures, and the different processes of cultivation, in the manner best adapted to the peculiarities of any given climate: it concerns itself only with the growth and nourishment of such plants as are indigenous, or, by a long course of treatment, have become inured to the vicissitudes of weather incidental to a particular latitude. The former occupies a much wider field of research; it not only seeks to

be conversant with the constitution of soils, but, as it aspires to the preservation and propagation of exotic vegetation, it necessarily embraces the consideration of varieties of climate: and it labours, by art, to assimilate the confined space of its operations to that constitution of atmosphere which is most congenial to its charge, or to protect them at different periods of their growth from sudden changes of weather which would be detrimental to their health. Experience has anticipated theoretical knowledge in suggesting various artifices, by which these ends may be effected; a connected view of which has never, I believe, been attempted; but may prove to be not without interest and utility. The suggestions of experience may probably enlarge the conclusions of theory, while it is not impossible that the improved state of the latter, may be found to furnish some assistance to the former.

The science of Horticulture, with regard to climate, will be best considered in two divisions: the first comprises the methods of mitigating the extremes, or exalting the energies, of the natural climate in the open air; the second embraces the more difficult means of composing and maintaining a confined atmosphere, whose properties may assimilate with those of the natural atmosphere in intertropical latitudes. I shall commence my observations with the former.

The basis of the atmosphere has been proved to be of the same chemical composition in all the regions of the globe. All the varieties of climate will therefore be found to depend upon the modifications impressed upon it by light, heat, and moisture, and over these, art has obtained, even in the open air, a greater influence than at first sight would appear to be possible. By judicious management, the climate of our

gardens is rendered congenial to the luxurious productions of more favoured regions, and flowers and fruits from the confines of the tropics, flourishing in the open air, daily prove the triumphs of knowledge and industry.

For the complete understanding of the subject in all its bearings, and to enable us to derive all the practical advantages which such an understanding would certainly afford, it would be necessary to have a full knowledge of the peculiarities of the climate of every region of the earth, a knowledge which we are very far from yet possessing; but to which, rapid advances are daily making. But above all, it seems necessary that we should understand the atmospheric variations of our own situation. These, though not constituting the greatest range with which we are acquainted, are great, and oftentimes sudden. The range of the thermometer in the shade is from 0° to 90° of FAHRENHEIT'S scale; but under favourable circumstances the heat of the sun's rays reaches 135°, the changes of moisture extend from 1.000, or saturation, to .389.* Now the great object of the

* The *Dew-point* (a term which will often occur in the course of this Paper) is the degree of temperature at which the moisture of the atmosphere would begin to precipitate, and may readily be ascertained at all seasons by means of the hygrometer. The natural scale of the hygrometer is included between the points of perfect dryness, and perfect moisture: the latter, of course, being that state of the atmosphere at which the *dew-point* coincides with the temperature of the air. The intermediate degrees may be ascertained by dividing the elasticity of vapour at the temperature of the dew-point by the elasticity at the temperature of the air: the quotient will express the proportion of moisture actually existing, to the quantity which would be required for saturation; for, calling the term of saturation 1.000, as the elasticity of vapour at the temperature of the air is to the elasticity of vapour at the temperature of the dew-point, so is the term of saturation to the actual degree of moisture. The necessary tables for facilitating this

Horticulturist is to stretch, as it were, his climate to the south, where these extremes of drought and cold never occur; and not only to guard against the injurious effects of the ultimate severity of weather, but to ward off the sudden changes which are liable to recur in the different seasons of the year. To enable us to understand the methods of effecting this end, it will be necessary to consider the means by which these changes are brought about in the general course of nature. The principal of these will be found to be, wind and radiation.

The amount of evaporation from the soil, and of exhalation from the foliage of the vegetable kingdom, depends upon two circumstances, the saturation of the air with moisture, and the velocity of its motion. They are in inverse proportion to the former and in direct proportion to the latter.

When the air is dry, vapour ascends in it with great rapidity from every surface capable of affording it, and the energy of this action is greatly promoted by wind, which removes it from the exhaling body as fast as it is formed, and prevents that accumulation which would otherwise arrest the process.

Over the state of saturation, the Horticulturist has little or no control in the open air, but over its velocity he has some command. He can break the force of the blast by artificial means, such as walls, palings, hedges, or other screens; or he may find natural shelter in situations upon the acclivities of hills. Excessive exhalation is very injurious

calculation, and more detailed explanations than it is possible to comprise in a note, may be had, with the hygrometer, at Mr. Newman's in Lisle Street, or may be found in the author's *Meteorological Essays.*

to many of the processes of vegetation, and no small proportion of what is commonly called *blight,* may be attributed to this cause. Evaporation increases in a prodigiously rapid ratio with the velocity of the wind, and any thing which retards the motion of the latter, is very efficacious in diminishing the amount of the former; the same surface, which in a calm state of the air would exhale 100 parts of moisture, would yield 125 in a moderate breeze, and 150 in a high wind. The dryness of the atmosphere in spring renders the effect most injurious to the tender shoots of this season of the year, and the easterly winds especially are most to be opposed in their course. The moisture of the air flowing from any point between N. E. and S. E. inclusive is to that of the air from the other quarter of the compass, in the proportion of 814 to 907 upon an average of the whole year: and it is no uncommon thing in spring for the dew-point to be more than 20 degrees below the temperature of the atmosphere in the shade, and I have even seen the difference amount to 30 degrees. The effect of such a degree of dryness is parching in the extreme, and if accompanied with wind is destructive to the blossoms of tender plants. The use of high walls, especially upon the northern and eastern sides of a garden, in checking this evil, cannot be doubtful, and in the case of tender fruit trees, such screens should not be too far apart.

And here theory would suggest another precaution, which I believe has never yet been adopted, but which would be well worthy of a trial. When trees are trained upon a wall with a southern aspect, they have the advantage of a greatly

exalted temperature, but this temperature, in spring, differs from the warmth of a more advanced period of the year, or of a more southern climate, in not being accompanied by an increase of moisture. In the extremely dry state of the atmosphere to which I am now alluding, the enormous exhalation from the blossoms of tender fruit trees, which must thus be induced, cannot fail of being extremely detrimental; the effect of shading the plants from the direct rays of the sun should therefore be ascertained. The state of the weather to which I refer, often occurs in April, May, and June, but seldom lasts many hours. Great mischief, however, may arise in a very small interval of time, and the disadvantage of a partial loss of light cannot be put in comparison with the probable effect which I have pointed out.

During the time in which I kept a register of the weather, I have seen in the month of May, the thermometer in the sun at 101°, while the dew-point was only 34°, the state of saturation of the air, upon a south wall, consequently only amounted to 120, a state of dryness which is certainly not surpassed by an African Harmattan. The shelter of a mat on such occasions, would often prevent the sudden injury which so frequently arises at this period of the year.

Some of the present practices of gardening are founded upon experience of similar effects, and it is well known that cuttings of plants succeed best in a border with a northern aspect protected from the wind: or, if otherwise situated, they require to be screened from the force of the noon-day sun. If these precautions be unattended to, they speedily droop and die. For the same reason, the autumn is selected

for placing them in the ground, as well as for transplanting trees; the atmosphere at that season being saturated with moisture, is not found to exhaust the plant before it has become rooted in the soil.

Over the absolute state of vapour in the air we are wholly powerless, and by no system of watering can we affect the dew-point in the free atmosphere. This is determined in the upper regions; it is only therefore by these indirect methods, and by the selection of proper seasons, that we can preserve the more tender shoots of the vegetable kingdom from the injurious effects of excessive exhalation.

Radiation, the second cause which I have mentioned as producing a sudden and injurious influence upon the tender products of the garden, is one that has been little understood, till of late years, by the natural philosopher; and even to this day has not been rendered familiar to the practical gardener; who, although he has been taught by experience to guard against some of its effects, is totally unacquainted with the theory of his practice. Dr. Wells, to whose admirable *Essay upon Dew*, we are so much indebted for our present knowledge upon this important subject, thus candidly remarks upon this anticipation of science: "I had often, in "the pride of half knowledge, smiled at the means frequently "employed by gardeners to protect tender plants from cold, "as it appeared to me impossible that a thin mat or any "such flimsy substance could prevent them from attaining "the temperature of the atmosphere, by which alone I "thought them liable to be injured. But when I had learned "that bodies on the surface of the earth become, during a "still and serene night, colder than the atmosphere, by

" radiating their heat to the heavens, I perceived immediately " a just reason for the practice which I had before deemed " useless."

The power of emitting heat in straight lines in every direction, independently of contact, may be regarded as a property common to all matter; but differing in degree in different kinds of matter. Co-existing with it, in the same degrees, may be regarded the power of absorbing heat so emitted from other bodies. Polished metals, and the fibres of vegetables may be considered as placed at the two extremities of the scale upon which these properties in different substances may be measured. If a body be so situated that it may receive just as much radiant heat as itself projects, its temperature remains the same; if the surrounding bodies emit heat of greater intensity than the same body, its temperature rises, till the quantity which it receives, exactly balances its expenditure, at which point it again becomes stationary: and if the power of radiation be exerted under circumstances which prevent a return, the temperature of the body declines. Thus, if a thermometer be placed in the focus of a concave metallic mirror, and turned towards any clear portion of the sky, at any period of the day, it will fall many degrees below the temperature of another thermometer placed near it, out of the mirror; the power of radiation is exerted in both thermometers, but to the first all return of radiant heat is cut off, while the other receives as much from the surrounding bodies, as itself projects. This interchange amongst bodies takes place in transparent *media* as well as in *vacuo;* but in the former case the effect is modified by the equalizing power of the medium.

Any portion of the surface of the globe which is fully turned towards the sun receives more radiant heat than it projects, and becomes heated; but when, by the revolution of the axis, this portion is turned from the source of heat, the radiation into space still continues, and being uncompensated, the temperature declines. In consequence of the different degrees in which different bodies possess this power of radiation, two contiguous portions of the system of the earth will become of different temperatures, and if on a clear night we place a thermometer upon a grass-plat, and another upon a gravel walk or the bare soil, we shall find the temperature of the former many degrees below that of the latter. The fibrous texture of the grass is favourable to the emission of the heat, but the dense surfaces of the gravel seem to retain and fix it. But this unequal effect will only be perceived when the atmosphere is unclouded, and a free passage is open into space; for even a light mist will arrest the radiant matter in its course, and return as much to the radiating body as it emits. The intervention of more substantial obstacles will of course equally prevent the result, and the balance of temperature will not be disturbed in any substance which is not placed in the clear aspect of the sky. A portion of a grass-plat under the protection of a tree or hedge, will generally be found, on a clear night, to be eight or ten degrees warmer than surrounding unsheltered parts, and it is well known to gardeners that less dew and frost are to be found in such situations than in those which are wholly exposed.

There are many independent circumstances which modify the effects of this action, such as the state of the radiating body, its power of conducting heat, &c. If, for instance, the

body be in a liquid or aeriform state, although the process may go on freely, as in water, the cold produced by it will not accumulate upon the surface, but will be dispersed by known laws throughout the mass; and if a solid body be a good radiator but a bad conductor of heat, the frigorific effect will be condensed upon the face which is exposed. So upon the surface of the earth absolute stillness of the atmosphere is necessary for the accumulation of cold upon the radiating body; for if the air be in motion, it disperses and equalizes the effect, with a rapidity proportioned to its velocity.

It is upon these principles that Dr. Wells has satisfactorily explained all the phenomena connected with dew or hoar frost. This deposition of moisture is owing to the cold produced in bodies by radiation, which condenses the atmospheric vapour upon their surfaces. It takes place upon vegetables, but not upon the naked soil. The fibres of short grass are particularly favourable to its formation. It is not produced either in cloudy or in windy weather, or in situations which are not perfectly open to the sky. It is never formed upon the good conducting surfaces of metals, but is rapidly deposited upon the badly conducting surfaces of filamentous bodies, such as cotton, wool, &c.

In remarking that dew is never formed upon metals, it is necessary to distinguish a secondary effect which often causes a deposition of moisture upon every kind of surface indiscriminately. The cold which is produced upon the surface of the radiating body, is communicated by slow degrees to the surrounding atmosphere, and if the effect be great and of sufficient continuance, moisture is not only deposited upon the solid body, but is precipated in the air itself; from which

it slowly subsides, and settles upon every thing within its range.

The formation of dew is one of the circumstances which modify and check the refrigerating effect of radiation; for, as the vapour is condensed, it gives out the latent heat with which it was combined in its elastic form, and thus, no doubt, prevents an excess of depression which might in many cases prove injurious to vegetation. A compensating arrangement is thus established, which, while it produces all the advantages of this gentle effusion of moisture, guards against the injurious concentration of the cause by which it is produced.

The effects of radiation come under the consideration of the Horticulturist in two points of view: the first regards the primary influence upon vegetables, exposed to it; the second the modifications produced by it upon the atmosphere of particular situations. To vegetables growing in the climates, for which they were originally designed by nature, there can be no doubt that the action of radiation is particularly beneficial, from the deposition of moisture which it determines upon their foliage: but to tender plants artificially trained to resist the rigours of an unnatural situation, this extra degree of cold may prove highly prejudicial. It also appears probable, from observation, that the intensity of this action increases with the distance from the equator to the poles; as the lowest depression of the thermometer which has been registered between the tropics, from this cause, is 12°, whereas in the latitude of London, it not unfrequently amounts to 17°. But however this may be, it is certain that vegetation in this country is liable to be affected at night from the influence of radiation, by a temperature below the freezing

point of water, ten months in the year; and even in the two months, July and August, which are the only exceptions, a thermometer covered with wool will sometimes fall to 35°. It is, however, only low vegetation upon the ground which is exposed to the full rigour of this effect. In such a situation the air which is cooled by the process, lies upon the surface of the plants, and from its weight cannot make its escape; but from the foliage of a tree or shrub, it glides off and settles upon the ground.

Any thing which obstructs the free aspect of the sky arrests in proportion the progress of this refrigeration, and the slightest covering of cloth or matting annihilates it altogether. Trees trained upon a wall or paling, or plants sown under their protection, are at once cut off from a large portion of this evil; and are still further protected, if within a moderate distance of another opposing screen. The most perfect combination for the growth of exotic fruits in the open air would be a number of parallel walls within a short distance of one another, facing the south-east quarter of the heavens; the spaces between each should be gravelled, except a narrow border on each side, which should be kept free from weeds and other short vegetables. On the southern sides of these walls, Peaches, Nectarines, Figs, &c. might be trained to advantage, and on their northern sides, many hardier kinds of fruit would be very advantageously situated. Tender exotic trees would thus derive all the benefit of the early morning sun, which would at the earliest moment dissipate the greatest accumulation of cold which immediately precedes its rise, and the injurious influence of nocturnal radiation would be almost entirely prevented. Upon trees

so trained, the absolute perpendicular impression could have little effect, and this little might even be prevented by a moderate coping,

Mats or canvass, upon rollers to draw down occasionally in front of the trees, at the distance of a foot or two from their foliage, would, I have no doubt, be a great advantage in certain dry states of the atmosphere before alluded to, and in the case of walls which are not opposed to others, would be a good substitute for the protection of the latter.

Experience has taught gardeners the advantages of warding off the effects of frost from tender vegetables, by loose straw or other litter, but the system of matting does not appear to be carried to that extent which its simplicity and efficacy would suggest. Neither does the manner of fixing the screen exhibit a proper acquaintance with the principle upon which it is resorted to: it is generally bound tight round the tree which it is required to protect, or nailed in close contact with its foliage.

Now it should be borne in mind, that the radiation is only transferred from the tree to the mat, and the cold of the latter will be conducted to the former in every point where it touches. Contact should therefore be prevented by hoops or other means properly applied, and the stratum of air which is enclosed will by its low conducting power effectually secure the plant. With their foliage thus protected, and their roots well covered with litter, many evergreens might doubtless be brought to survive the rigour of our winters, which are now confined to the stunted growth of the green house and conservatory.

The secondary effect which radiation has upon the climate

of particular situations, is a point which is less frequently considered than the primary one which we have been investigating; but which requires perhaps still more attention. The utmost concentration of cold can only take place in a perfectly still atmosphere: a very slight motion of the air is sufficient to disperse it. A low mist is often formed in meadows in particular situations, which is the consequence of the slow extension of this cold in the air, as before described; the agitation of merely walking through this condensation is frequently sufficient to disperse and melt it. A valley surrounded by low hills, is more liable to the effects of radiation than the tops and sides of the hills themselves; and it is a well known fact that dew and hoar frost are always more abundant in the former than in the latter situations. It is not meant to include in this observation, places surrounded by lofty and precipitous hills which obstruct the aspect of the sky, for in such, the contrary effect would be produced. Gentle slopes which break the undulations of the air without naturally circumscribing the heavens, are most efficient in promoting this action, and it is worthy of remark and consideration, that by walls and other fences, we may artificially combine circumstances which may produce the same injurious effect.

But the influence of hills upon the nightly temperature of the vallies which they surround is not confined to this insulation; radiation goes on upon their declivities, and the air which is condensed by the cold, rolls down and lodges at their feet.

Their sides are thus protected from the chill, and a double portion falls upon, what many are apt to consider, the more

sheltered situation. Experience amply confirms these theoretical considerations. It is a very old remark, that the injurious effects of cold occur chiefly in hollow places, and that frosts are less severe upon hills than in neighbouring plains. It is consistent with my own observations that the leaves of the Vine, the Walnut-tree, and the succulent shoots of Dahlias and Potatoes, are often destroyed by frost in sheltered valleys, on nights when they are perfectly untouched upon the surrounding eminences; and I have seen a difference of 30 degrees on the same night between two thermometers placed in the two situations, in favour of the latter.

The advantages of placing a garden upon a gentle slope must be hence very apparent: a running stream at its foot would secure the further benefit of a contiguous surface, not liable to refrigeration, and would prevent any injurious stagnation of the air. Few situations are likely to fulfill all the conditions which theory would suggest for the most perfect mitigation of the climate in the open air; but the preceding remarks may not be without their use in pointing out localities, which, with this view, are most to be avoided.

Little is in the power of the Horticulturist to effect in the way of exalting the powers of the climate in the open air; except by choice of situation with regard to the sun and the concentration of its rays upon walls and other screens. The natural reverberation from these and the subjacent soil, is however very effective, and few of the productions of the tropical regions are exposed to a greater heat than a well trained tree upon a wall in summer. Indeed it would appear from experiment, that the power of radiation from the sun, like that of radiation from the earth, increases with the dis-

tance from the equator, and there is a greater difference between a thermometer placed in the shade, and another in the solar rays in this country, than in Sierra Leone, or Jamaica. The observations of the President of this Society upon the growth of Pine-apples is in exact accordance with this idea, for he has remarked that this species of plant, though extremely patient of a high temperature, is not by any means so patient of the action of very continued bright light as many other plants, and much less so than the Fig and Orange tree; and he is inclined to think that on this account they may be found to ripen their fruit better in the spring than in the middle of the summer.* This energy of the sun is at times so great that it often becomes necessary to shade delicate flowers from its influence, and I have already pointed out a case in which it would be desirable to try the same precaution with the early blossom of certain fruit trees. The greatest power is put forth in this country in June, while the greatest temperature of the air does not take place till July. The temperature of summer may thus be anticipated a month, in well secured situations.

The greatest disadvantage to which Horticulture is subject in this climate, is the uncertainty of clear weather; a circumstance which art has, of course, no means to control; no artificial warmth is capable of supplying the deficiency when it occurs, and without the solar beams fruits lose their flavour and flowers the brightness of their tints. It has been attempted to communicate warmth to walls by means of fire and flues, but without the assistance of glass no great success has attended the trial.

* See Horticultural Transactions, vol. iv. page 548.

It is well known that solar heat is absorbed by different substances with various degrees of facility dependant upon their colours, and that black is the most efficacious in this respect. It has therefore been proposed to paint garden walls of this colour; but no great benefit is likely to arise from this suggestion. It is probable that in the spring, when the trees are devoid of foliage, the wood may thus be forced to throw out its blossom somewhat earlier than it otherwise would; but this would be rather a disadvantage, as the flower would become exposed to the vicissitudes of an early spring. It is more desirable to check than to force this delicate and important process of vegetation, as much injury may arise from its premature developement. When the tree has put forth its foliage, the colour of its protecting support can have no influence in any way: the leaves cover the surface and absorb the rays by their own inherent powers. The only known advantage which can be taken of this peculiar power in dark substances, is in the case of covering up fruits, to preserve them from the ravages of flies; grapes which are enclosed in bags of black crape ripen better than those in white; but I believe that it is admitted that neither do so well as those which are freely exposed.

I come now to the consideration of a confined atmosphere; the management of which, being entirely dependent upon art, requires in the Horticulturist a more extended acquaintance with the laws of nature, with regard to climate, and greater skill and experience in the application of his means. The plants which require this protection are in the most

artificial state, which it is possible to conceive; for, not only are their stems and foliage subject to the vicissitudes of the air in which they are immersed, but, in most cases their roots also. The soil in which they are set to vegetate is generally contained in porous pots of earthen ware, to the interior surface of which the tender fibres quickly penetrate and spread in every direction; they are thus exposed to every change of temperature and humidity, and are liable to great chills from any sudden increase of evaporation. This part of the subject naturally divides itself into two branches. The first regards the treatment of such exotics as are wholly dependent upon the artificial atmosphere of hot-houses: the second refers to the management of those hardier plants which only require to be preserved in green-houses part of the year, but during the summer months are exposed to the changes of the open air. I shall offer a few remarks first on the atmosphere of a hot-house.

The principal considerations which generally guide the management of gardeners in this delicate department are those of temperature; but there are others, regarding moisture, which are, I conceive, of at least equal importance. The inhabitants of the hot-house are all natives of the torrid zone, and the climate of this region is not only distinguished by an unvarying high degree of heat, but also by a very vaporous atmosphere. Captain Sabine, in his meteorological researches between the tropics, rarely found, at the hottest period of the day, so great a difference as ten degrees between the temperature of the air and the dew-point; making the degree of saturation about 730, but most frequently 5° or 850; and the mean saturation of the air could not have ex-

ceeded 910. Now I believe that if the hygrometer were consulted, it would be no uncommon thing to find in hot-houses, as at present managed, a difference of 20° between the point of condensation and the air, or a degree of moisture falling short of 500. The danger of over-watering most of the plants, especially at particular periods of their growth, is in general very justly appreciated; and in consequence the earth at their roots is kept in a state comparatively dry; the only supply of moisture being commonly derived from the pots, and the exhalations of the leaves is not enough to saturate the air, and the consequence is a prodigious power of evaporation. This is injurious to the plants in two ways: in the first place, if the pots be at all moist, and not protected by tan or other litter, it produces a considerable degree of cold upon their surface, and communicates a chill to the tender fibres with which they are lined. The danger of such a chill is carefully guarded against in the case of watering, for it is one of the commonest precautions not to use any water of a temperature at all inferior to that of the hot air of the house; inattention to this point is quickly followed by disastrous consequences. The danger is quite as great from a moist flower pot placed in a very dry atmosphere.

The custom of lowering the temperature of fluids in hot climates, by placing them in coolers of wet porous earthen ware, is well known, and the common garden pot is as good a cooler for this purpose as can be made. Under the common circumstances of the atmosphere of a hot-house, a depression of temperature amounting to 15 or 20 degrees, may easily be produced upon such an evaporating surface. But the greatest mischief will arise from the increased exhalations of the plants

so circumstanced, and the consequent exhaustion of the powers of vegetation. The flowers of the torrid zone are many of them of a very succulent nature, largely supplied with cuticular pores, and their tender buds are unprovided with those integuments and other wonderful provisions by which nature guards her first embryo productions in more uncertain climates. Comparatively speaking they shoot naked into the world, and are suited only to that enchanting mildness of the atmosphere, for which the whole system of their organization is adapted. In the tropical climates the sap never ceases to flow, and sudden checks or accelerations of its progress are as injurious to its healthy functions as they are necessary in the plants of more variable climates to the formation of those *hybernacula* which are provided for the preservation of the shoots in the winter season. Some idea may be formed of the prodigiously increased drain upon the functions of a plant arising from an increase of dryness in the air from the following consideration. If we suppose the amount of its perspiration, in a given time, to be 57 grains, the temperature of the air being 75°, and the dew-point 70, or the saturation of the air being 849, the amount would be increased to 120 grains in the same time if the dew-point were to remain stationary, and the temperature were to rise to 80°; or in other words, if the saturation of the air were to fall to 726.

Besides this power of transpiration, the leaves of vegetables exercise also an absorbent function, which must be no less disarranged by any deficiency of moisture. Some plants derive the greatest portion of their nutriment from the vaporous atmosphere, and all are more or less dependent upon the

same source. The *Nepenthes distillatoria* lays up a store of water in the cup formed at the end of its leaves, which is probably secreted from the air, and applied to the exigencies of the plant when exposed to drought, and the quantity, which is known to vary in the hot-house, is no doubt connected with the state of moisture of the atmosphere.

These considerations must be sufficient, I imagine, to place in a strong light the necessity of a strict attention to the atmosphere of vapour in our artificial climates, and to enforce as absolute an imitation as possible of the example of nature. The means of effecting this is the next object of our enquiry.

Tropical plants require to be watered at the root with great caution, and it is impossible that a sufficient supply of vapour can be kept up from this source alone. There can however be no difficulty in keeping the floor of the house, and the flues continually wet, and an atmosphere of great elasticity may thus be maintained in a way perfectly analogous to the natural process. Where steam is employed as the means of communicating heat, an occasional injection of it into the air may also be had recourse to: but this method would require much attention on the part of the superintendant, whereas the first cannot easily be carried to excess.

It is true that damp air or floating moisture of long continuance would also be detrimental to the health of the plants, for it is absolutely necessary that the process of transpiration should proceed; but there is no danger that the high temperature of the hot-house should ever attain the point of saturation by spontaneous evaporation. The temperature of the external air will always keep down the force of the vapour; for as in the natural atmosphere the dew-point at the surface of the

earth is regulated by the cold of the upper regions, so in a house the point of deposition is governed by the temperature of the glass with which it is in contact. In a well ventilated hot-house, by watering the floor in summer, we may bring the dew-point within four or five degrees of the temperature of the air, and the glass will be perfectly free from moisture; by closing the ventilators we shall probably raise the heat 10 or 15 degrees, but the degree of saturation will remain nearly the same, and a copious dew will quickly form upon the glass, and will shortly run down in streams. A process of distillation is thus established, which prevents the vapour from attaining the full elasticity of the temperature.

This action is beneficial within certain limits, and at particular seasons of the year, but when the external air is very cold, or radiation proceeds very rapidly, it may become excessive and prejudicial. It is a well known fact, but one which I believe has never yet been properly explained, that by attempting to keep up in a hot-house the same degree of heat at night as during the day, the plants become scorched; from what has been premised it will be evident that this is owing to the low temperature of the glass, and the consequent low dew-point in the house, which occasions a degree of dryness which quickly exhausts the juices.

Much of this evil might be prevented by such simple and cheap means as an external covering of mats or canvass.

The heat of the glass of a hot-house at night cannot exceed the mean of the external and internal air, and taking these at 80° and 40°, 20 degrees of dryness are kept up in the interior, or a degree of saturation not exceeding 528. To this in a clear night we may add at least 6° for the effects

of radiation, to which the glass is particularly exposed, which would reduce the saturation to 434°, and this is a degree of drought which must be nearly destructive. It will be allowed that the case which I have selected is by no means extreme, and it is one which is liable to occur even in the summer months. Now by an external covering of mats, &c. the effects of radiation would be at once annihilated, and a thin stratum of air would be kept in contact with the glass which would become warmed, and consequently tend to prevent the dissipation of the heat. But no means would of course be so effective as double glass including a stratum of air. Indeed such a precaution in winter seems almost essential to any great degree of perfection in this branch of Horticulture. When it is considered that a temperature at night of 20° is no very unfrequent occurrence in this country, the saturation of the air may upon such occasions fall to 120°, and such an evil can only at present be guarded against by diminishing the interior heat in proportion; but whether we run upon Scylla or Charybdis is no very desirable choice.

By materially lowering the temperature we communicate a check which is totally inconsistent with the welfare of tropical vegetation. The chill which is instantaneously communicated to the glass by a fall of rain and snow, and the consequent evaporation from its surface, must also precipitate the internal vapour, and dry the included air to a very considerable amount, and the effect should be closely watched I do not conceive that the diminution of light which would be occasioned by the double panes, would be sufficient to occasion any serious objection to the plan. The difference would not probably amount to as much as that between hot-

houses with wooden rafters and lights, and those constructed with curvilinear iron bars, two of which have been erected in the Garden of the Horticultural Society. It might also possibly occasion a greater expansion of the foliage; for it is known that in houses with a northern aspect, the leaves grow to a larger size than in houses which front the south. Nature thus makes an effort to counteract the deficiency of light by increasing the surface upon which it is destined to act.

The present method of ventilating hot-houses is also objectionable, upon the same principles which I have been endeavouring to explain. A communication is at once opened with the external air, while the hot and vaporous atmosphere is allowed to escape at the roof; the consequence is, that the dry external air rushes in with considerable velocity, and becoming heated in its course, rapidly abstracts the moisture from the pots and foliage. This is the more dangerous, in as much as it acts with a rapidity proportioned in a very high degree to its motion. I would suggest it as a matter of easy experiment whether great benefit might not arise from warming the air to a certain extent, and making it traverse a wet surface before it is allowed to enter the house.

There is one practice universally adopted by gardeners, which is confirmatory of these theoretical speculations, namely, that of planting tender cuttings of plants in a hot bed, and covering them with a double glass. Experience has shewn them that many kinds will not succeed under any other treatment. The end of this is obviously to preserve a saturated atmosphere; and it affords a parallel case to that of Dr. Wells of the anticipation of theory by practice.

The effect of keeping the floor of the hot-house continually wet has been already tried at the Society's Garden, at my suggestion, and it has been found that the plants have grown with unprecedented vigour: indeed their luxuriance must strike the most superficial observer.

To the human feelings the impression of an atmosphere so saturated with moisture is very different from one heated to the same degree without this precaution; and any one coming out of a house heated in the common way, into one well charged with vapour, cannot fail to be struck with the difference. Those who are used to hot climates have declared that the feel and smell of the latter exactly assimilate to those of the tropical regions.

But there is a danger attending the very success of this experiment, which cannot be too carefully guarded against. The trial has been made in the summer months, when the temperature of the external air has not been low, nor the change from day to night very great. In proportion to the luxuriance of the vegetation will be the danger of any sudden check, and it is much to be feared, that unless proper precautions are adopted, the cold, long nights of winter may produce irreparable mischief.

I am aware that a great objection attaches to my plan of the double glass, on account of the expense, but I think that this may appear greater at first sight than it may afterwards be found to be in practice. It is however, at all events, I submit, a point worthy of the Horticultural Society to determine, and if the suggestion should be found to be effective, the lights of many frames which are not commonly in use in winter might, without much trouble, be fitted to slide over the

hot-houses during the severe season: and in the spring, when they are wanted for other purposes, their places might be supplied at night by mats or canvass.

The principles which I have been endeavouring to illustrate should be doubtless extended to the Pinery and the Melon frame, in the latter of which a saturated atmosphere might be maintained by shallow pans of water. An increase in the size of the fruit might be anticipated from this treatment, without that loss of flavour which would attend the communication of water to the roots of the plants.

I have but few additional observations to offer upon the artificial climate of a green-house. The remarks which have been made upon the atmosphere of the hot-house are applicable to it; though not to the same extent. The plants which are subject to this culture seldom require an artificial temperature greater than 45° or 50°, and few of them would receive injury from a temperature so low as 35°. When in the house they are effectually sheltered from the effects of direct radiation, which cannot take place through glass: but the glass itself radiates very freely, and thus communicates a chill to the air, which might effectually be prevented by rolling mats. With this precaution, fire would be but rarely wanted in a good situation, to communicate warmth. But in this damp climate it may be required to dissipate moisture. The state of the air should be as carefully watched with this view, as where a high temperature is necessary, to guard against the contrary extreme. Free transpiration, as I have before remarked, is necessary to the healthy progress of vegetation, and when any mouldiness or damp appears upon the plants, the temperature of the air should be moderately

raised, and free ventilation allowed. When the pots in the proper season are moved into the open air, it would contribute greatly to their health to preserve them from the effects of too great evaporation, to imbed them well in moss or litter: as a substitute for this precaution, the plants are generally exposed to a northern or eastern aspect where the influence of the sun but rarely reaches them, but which would be very beneficial if their roots were properly protected. The advantage of such a protection may be seen when the pots are plunged into the soil, a method which communicates the greatest luxuriance to the plants, but unfits them to resume their winter stations.

When a green-house is made use of, as it often is, after the removal of the pots, to force the vine, the same precautions should be attended to as in the management of the hothouse, and the elasticity of the vapour should be maintained by wetting the floor; but after a certain period a great degree of dryness should be allowed to prevail, to enable the tree to ripen its wood, and form the winter protection for its buds. In this its treatment differs from that of the tropical plants, which require no such change, and to which, on the contrary, it would be highly detrimental. The same observation applies to forcing houses for Peaches, and other similar kinds of trees. As soon as the fruit is all matured they should be freely exposed to the changes of the weather.

Upon an attentive consideration and review of the subject, it appears to me certain that a frequent consultation of the indications of the hygrometer is quite as necessary to the Horticulturist as of those of the thermometer, and it is not unworthy of the consideration of the Horticultural Society,

whether correct registers of the state of the climate, both in their houses and out of doors, and a connected series of experiments upon the modifications of which it is susceptible, might not contribute something to the perfection of that art, which they are making such honourable exertions to perfect and communicate.

To me it will be a source of great satisfaction if any observations which I have made, or may make, upon the subject of climate, should prove to be at all instrumental in forwarding their important views.

II. *On the* Use of Charcoal Dust, *as a Top Dressing for Onions, and as a Cure for the Clubbing in Cabbages, &c. In a Letter to the Secretary. By Mr.* Thomas Smith, *Corresponding Member of the Horticultural Society, Gardener to* Matthew Bell, *Esq. F. H. S. at Woolsington, Northumberland.*

Read August 3, 1824.

Sir,

Having seen some Papers in the *Transactions of the Horticultural Society* upon the cultivation of Onions, but none that took any notice of a disease to which those roots are very subject, I venture to lay the following experiments, and their results before the Society.

The garden I superintend is a very wet, stiff soil, upon a strong clay, and without any declivity. For several years my crops of Onions were nearly all destroyed by a grub, and by mouldiness coming on about their roots at various stages of their growth; sometimes when they were about the size of what we call Scallions, at other times when they were beginning to form a bulb, and even when the bulb was formed.

As soon as the disease takes place, it may very readily be perceived by the Onion blade assuming a glaucous green colour, but very soon after changing to yellow, and the leaves at the same time rather flag. I tried various quarters in the garden, and found that there was a difference in them, some of them producing more of the disease than others. I also tried

several experiments to prevent the disease taking place, but none had the desired effect, until I made use of charcoal dust (which is the refuse that is left at the bottom of a charcoal pit after the charcoal for use is taken out), spread upon the top of the ground intended for Onions, about half an inch thick, before the seed is sown (the ground being previously well dug and manured), and merely scuffled in with the point of a spade, so as to mix the top soil and charcoal dust together. Nothing more is after required beyond managing the crop in the usual way.

For these last six years, I have had most excellent crops of Onions, and not the least appearance of any infection. My first experiment was in the spring of 1818, upon a bed fifty feet long, and five feet wide, prepared in the usual way, one half the bed was dressed with charcoal dust, the other half without it, the part on which the dust was laid had an excellent crop of Onions, it remained quite clean and free from any disease, whilst the part to which the dust was not applied, was entirely destroyed by the grub and by mouldiness.

In 1819, I determined to try the effects of the dust upon a larger scale, I therefore had the whole of the quarter prepared for Onions, and divided it into eight beds of the same size as before; four of the beds were treated with dust, the other four remained without it. The result was the same as before; the beds where the dust was applied bore a good clean crop, whilst the others were affected. Having had two years proof of the good effects of the charcoal dust, in preventing the disease from taking place upon the Onion on one quarter, I have since tried it upon different quarters, with the best success.

The charcoal dust ought to be kept quite dry, which is easily done by placing it in a round heap, and covering it closely over with turf, until it is wanted.

I have also found that the application of charcoal dust effectually prevents the clubbing in the roots of Cabbages, &c. I had been accustomed to use lime fresh from the kiln for that purpose, and always with considerable advantage, but since I have made use of the charcoal dust upon different quarters of the garden, and any of the Brassica tribe has been subsequently planted there, the clubbing has entirely disappeared. In 1822, I planted a quarter with Cauliflower plants which never arrived at maturity, being very much injured with the club. In the spring of 1823, I had the same quarter prepared for Onions, with charcoal dust upon it; as soon as the Onions were cleared off in October, I had it well dug over, and planted it immediately with early Cabbages, which all arrived at maturity early this last spring, without the least appearance of clubbing.

I remain,

your obedient humble servant,

THOMAS SMITH.

Woolsington, near Newcastle upon Tyne,
July 18, 1824.

III. *Observations on, and an Account of, Plants growing in the Neighbourhood of Constantinople, Seeds of which were collected and transmitted to the Horticultural Society of London. In a Letter to the Secretary. By the Rev.* Robert Walsh, *LL. D. Corresponding Member of the Horticultural Society.*

Read July 6, 1824.

Dear Sir,

When I left England, I promised to send you seeds and specimens of such plants, from the neighbourhood of Constantinople, as might be rare and curious. I had not hitherto done so, because I conceived, I did not possess sufficient to interest you. I last year, however, made a tour in Asia, and having picked up a few plants which I thought worth transplanting into the Palace Garden, where they were not before, it occurred to me that some of them might be acceptable, I have therefore now made a collection of the seeds of all the trees and shrubs in this country which are prized here, or not common in England, as also of the Esculents that are sold in the markets, or grown in gardens. Among the latter you will find a collection of *Gourds* and *Melons*, containing, I believe, nearly all that are cultivated in this part of the East, about thirty species and varieties.

Having for some time amused myself with endeavours to ascertain the identity of the plants existing here, with those described by Theophrastus, Dioscorides, and Pliny, whose vague descriptions are sometimes very unsatisfactory;

I have endeavoured to ascertain what have not been described by those authors, and are therefore new plants, although apparently indigenous. A few remarks of this kind I have added to my list of the seeds which I send. I have also given some of the local names, and present uses; these, I trust, you will find an appropriate accompaniment to the seeds.

And now, dear Sir, I have only to add, that I shall be glad to hear from you on any subject in which I can assist the objects of the Society, and request you to believe that I am with great truth, very faithfully yours, &c.

ROBERT WALSH.

British Palace, Pera, Constantinople,
March 6, 1824.

TREES AND SHRUBS.

Cercis Siliquastrum.

This tree does not appear to have been known to, or described by the ancients. There is no good reason to suppose that the Κικὶς or Κερκὶς of THEOPHRATUS* was the same. It abounds, notwithstanding, in these countries at the present day, and is found clothing the shores of the Bosphorus, and the sides of Mount Libanus. It is very beautiful in all its stages. Very early in spring, flowers of a bright pale red burst out before any leaf appears, not only from every part of the branches, but from the trunk, piercing the thick strong bark nearly down to the root in a very remarkable manner, and it is, for this

* Lib. iii. c. 13. edit. STACKHOUSE.

reason, called *Red Bud.* These buds are gathered and used with other raw vegetables, by the Greeks and Turks, in salads, to which they give an agreeable colour and taste. As it is a very beautiful tree in all its stages, it is every where planted, and in spring gives a ruddy hue to the shores of the Bosphorus. It is hardy, and bears well the winter of this climate, which, so near the Black sea, is sometimes very severe.

Ceratonia Siliqua.

This tree is described by Dioscorides* and Pliny,† and was well known to the ancients. I found it in great abundance at Malta, where it is almost the only tree that grows, relieving the irksome sameness of the white stone enclosures with its dark foliage. It grows also in the islands of the Archipelago, but never in the immediate vicinity of Constantinople. The substance of the pod is thick and pulpy, remarkably sweet and nutritious, and hence it has always been an article of food in these countries. Pliny calls it *Siliqua prædulcis.*† At the present day it is sent from Palestine to Alexandria in ship loads, and from thence over the Mediterranean, and as far as Constantinople, where it is sold in all the shops. It resembles manna in taste and consistence, and is sometimes used as sugar to preserve other substances. But the circumstance that has rendered it famous, is the controversy whether it was not the *real food* of St. John in the wilderness. Some of the Fathers‡ assert that the ακριδες or locusts

* Lib. i. cap. 158. edit. Sarraceni.

† Hist. Nat. Lib. xv. cap. 24. edit. Hardouini.

‡ Isidore, &c. ἁι ἀκρὶδες, ἂς Ιωάννης ἐτρέφετο, ὄυ ζῶα εἰσιν, ὥς τινες οἴονται ἀμαθῶς, ἀλλ' ἀκρέμονες βοτανῶν ἢ φυτῶν. τ.κ.λ. S. Isid. Pelus. Ep. 132.

of St. JOHN, were some vegetable substance, quasi ακρον δρυος, and the μελι αγριον, wild honey, the sweet saccharine matter of this pod. It is certain that the plant grows in great abundance in the wilderness of Palestine, where its produce is at this day used for food. It is called by the Arabs ***Kharoob***, and by the Franks ***St. John's Bread.****

Celtis Australis.

This is a large tree very common in this country. Its leaf is rough, and nearly resembles a Nettle, and hence it is sometimes called the *Nettle tree*. It bears a berry which changes its hue from light yellow to dark brown, and has a sweet pleasant taste, and hence it is conjectured by SIBTHORP to be the Λωτος δενδρον of DIOSCORIDES,† which HOMER says has so sweet a taste, that those who eat it forget their own country.‡ The modern Greeks are very fond of it.

Cupressus Horizontalis.

This was supposed by PLINY to be the *mas* or male of the Cupressus Sempervirens,‡ and modern botanists consider it only a variety; but undoubtedly it is a different species. The character of the whole tree is distinct and permanent, the branches project as horizontally as those of an oak, and the tree more resembles a *Pine* than a *Cypress*. It is in great abundance mixed with the C. Sempervirens in all the Turkish Cemeteries. Whenever a Turk of respectability buries one of his family, he plants a young Cypress at the head of his grave, as well because its aromatic resin qualifies

* San Jans Broot. Rauwolf, edit. Gronov. p. 36.

† Lib. i. cap. 171. ‡ Odyss. Lib. ix. § Hist. Nat. Lib. xvi. cap. 33.

the putrid effluvia of the place, as because its evergreen foliage is an emblem of immortality. It is never planted in the cemeteries of the modern Greeks, though it was from them, perhaps, the Turks adopted the practice.

Diospyros Lotus.

This fine tree is not decribed by the ancients, though it is now found every where along the Bosphorus, where the large pinnated foliage gives it a very striking appearance. It was originally brought from the country between the Euxine and Caspian seas, and is therefore called the *Date of Trebisonde.* It bears abundantly a light brown fruit, nearly as large as a Walnut, which is sometimes sold in the markets under the name of *Tarabresan Curmasi.* The recent fruit is austere, but would make a good conserve.

Elæagnus Angustifolia.

This is the *Wild Olive* described by THEOPHRASTUS,* DIOSCORIDES,† and PLINY.‡ It grows every where about Constantinople, in low situations and humid soils, and has much more the habit and appearance of a Willow than of an Olive; the under surface of the leaf is hoary, however, like the latter, and sometimes so bright as to resemble a plating of silver. The fruit is constantly sold in the markets under the name of *Ighidé agághi,* and is usually brought from the low grounds about Scutari, and other similar places on the Asiatic shore. It abounds with a dry, mealy, saccha-

* Lib. iv. cap. 8. † Lib. i. cap. 137. ‡ Hist. Nat. Lib. xxiii. c. 4.

rine substance, which is sweet and pleasant, and the fruit has the property of retaining a long time it usual size and form.

Rhamnus Zizyphus.

This tree has excited great controversy among botanists, and LINNÆUS, WILLDENOW, MICHAUX, and PERSOON, all differ in their description of it.* SHAW † supposes it was like the Lotus of THEOPHRASTUS and PLINY, and Sir JAMES SMITH that it was the Paliurus. What is certain however is, that it is the tree which produces the fruit sold in abundance in the markets of Constantinople, under the name of *Hunnáb agághi,* and which has for a long time been imported into the west of Europe, under the name of *Jujube.* It is minutely and accurately described by POMET, LEMERY, and TOURNEFORT, and forms an article in the old Pharmacopœias. I met with it frequently in the Ionian islands, and the Turks of Constantinople plant it before their coffee-houses, with other trees, to enjoy the shade and fruit in their seasons.

Rhamnus Paliurus.

This is the common thorn of the hedges in Asia, and forms a fence of the most impassable kind. It is covered with spines which stand in pairs, one hooked and the other straight, very strong and sharp, and when the smallest part of a person's dress becomes entangled, the whole is soon seized, and it is impossible to be extricated without great laceration, as I have often experienced. I am disposed to think that this is the real *Christ's Thorn,* rather than that called the *Spina*

* PERSOON Synopsis, vol. i. page 240.

† See SHAW's Travels, page 226.

Christi, from which it materially differs in the seed vessel, which is surrounded by a membranous wing, giving it a singular appearance. The flowers are very insignificant, but the seed vessels, when full formed and before they are ripe, are of a vivid light green or yellow, and hanging in profuse clusters, give the tree the appearance of being clothed with rich flowers. The seeds are sold in the herb shops of Constantinople, and the native *Hakims,* or doctors, prescribe them in many complaints under the name of *Xallé.* They are also used as a dye.

Melia Azederacht.

This tree does not appear to have been known to the ancients, though it is now found abundantly all through the Mediterranean and the Archipelago, in Europe, Asia, and Africa. It is always planted in the area of a monastery, and the Caloyers, or Greek monks, form the ribbed seeds into beads, and hence it is called the *Bead tree.* The white pulpy exterior of the seeds is said to be highly poisonous, and Avicenna, the Arabian physician, cautions people even against the leaves and wood; hence the Arabs call it *Zederacht,* which signifies poison; the seeds are never eaten by birds. It is however a very beautiful tree, with large compound pinnate foliage, and rich spikes of lilac flowers.

Acacia Julibrissin.

This is an exceedingly beautiful tree, and by far the largest of all the genus, and justly denominated *Arboreá* by Forskal. There is one in the British Palace garden at Constantinople, which measures three feet in circumfer-

ence near the base of the trunk. Though not mechanically sensitive when touched, it is highly susceptible of the variations of the atmosphere. The pinnate foliage affords a thick shade on a bright day, but when rain impends, or even when a cloud passes over the face of the sun, the leaflets immediately close their under surfaces together, and the tree seems divested of its leaves. When the sun again appears, the leaflets reassume their horizontal position, and expand so speedily, that the motion is sometimes perceptible. The flowers are still more beautiful than the foliage. They consist of large pencils or clusters of stamens of a bright pink hue, and rich silky texture, and hence the Turks, who are particularly fond of the tree, have given it the soft and fanciful name of *Gul Ibrisim*, the *Silk Rose*, and hence is derived its specific name with Botanists. It is now found in all the gardens of the Bosphorus, but it is not a native, nor is it described by the ancients.

Pistacia Terebinthus.

This tree was well known, and is accurately described by DIOSCORIDES,* THEOPHRASTUS,† and PLINY.‡ THEOPHRASTUS, and PLINY after him, mention a singularity in the tree, not noticed by modern writers, though very remarkable: Φέρει δὲ καὶ κωρυκώδη τινὰ κοῖλα, καθάπερ ἡ πτελέα, ἐν οἷς θηρίδια ἐγγίνεται κωνοποειδῆ· ἐγγίνεται δὲ τὶ ῥητινωδες εν τουτοις καὶ γλισχρον.§ In all the trees of this species which I have met with, I have observed this. A species of gnat, or aphis, forms a nidus at

* Lib. i. cap. 91. † Lib. iii. cap. 14. ‡ Hist. Nat. Lib. xiii. cap. 6.

§ Lib. iii. cap. 14. It bears, like the Elm, follicles in which a gnat-like insect breeds; in these, too, is found a resinous, viscid substance.

the extremity of the leaves, by puncturing the cuticle, which becomes fungous, and swells into fleshy follicles of a bright scarlet hue, strong resinous odour, and clammy feel, full of turpentine. These are so abundant, sometimes, as to cover the whole surface of the tree, and give it the appearance of bearing rich flowers or fruit. The trunk of the tree, when perforated, yields abundantly that fine resinous oil called *Cyprus Turpentine.* For its aromatic quality, the Greeks and Armenians plant the tree in their cemeteries, as the Turks do the Cypress. Here the Turks make them butts to discharge their topheks or pistols at; the stems, therefore, are all perforated, and continually, in the season, stream with turpentine. There is one in the British Palace Garden, which has been noticed by SESTINI and others, for its size and remarkable beauty: it measures twelve feet in circumference, rises nearly as high as the top of the palace, and shades a circle of one hundred and eighty yards. Notwithstanding their size, they are sometimes parasitical, growing out of other trees. A phænomenon of this kind exists at the promontory of Chalcædon, where an enormous Pistacia is growing out of a more enormous Cypress; and this is noticed by ANDREOSSI, in his work *sur le Bosphore.* They grow every where among the ruins of the wall of Constantinople, particularly in the breach where the Turks entered; "marking," as CLARKE says, "the spot where the last of the PALEOLOGI fell." *

Pistacia Lentiscus.

This plant, called by THEOPHRASTUS † and DIOSCORIDES,‡ Σχινος, and yielding the pure transparent gum, Μαστίχη, was

* CLARKE's Travels, part 2, sect. 3, ch. xv. † Lib. ix. cap. 1. ‡ Lib. i. cap. 89.

produced in the greatest abundance in their days, as at present, in the island of Scio. The Sultan reserves the property of the Mastic trees to himself, and twenty large villages on the island were confined solely to the produce of the gum, and obliged to furnish annually 286 boxes, each weighing eighty okes, or two hundred pounds. The greater part of this large quantity was consumed by the females of the Seraglio. The Turkish women are passionately fond of chewing this gum, both to preserve their teeth, and improve their breath. It was also used for another purpose: the Greeks distill an ardent spirit from grape skins, called Ρακι, and to improve its flavour they dissolve in it a certain portion of Mastic. This spirit is as pure and colourless as water, but when water is added to it, it becomes of an azure milky hue, and opaque in proportion to the quantity of water added, the gum which was soluble in the alcohol becoming precipitated in the water. Since the misfortunes of Scio, the Mastic has become so scarce at Constantinople, that it was with some difficulty I procured the small quantity enclosed with the seed.

Smilax Aspera.
——— *Excelsa.*

The Smilax is one of the few plants so minutely described by the ancients, that it cannot be mistaken. The description of THEOPHRASTUS is particularly accurate.* It abounds in all the woods and hills on both sides of the Bosphorus; and the roots of both species are used in decoctions, like *Sarsaparilla,* for which they are sometimes substituted. The

* Lib. iii. cap. 17.

S. excelsa climbs to the tops of the highest trees, and descending in streaming branches, forms a lofty green wall by the road side, which looks curious; and, when covered with a profusion of rich red berries in autumn, is very beautiful. It is well adapted for forming arbours.

Euonymus Europæus, Var.

This variety of a common tree is distinguished by the aril of the seed, which is of a rich scarlet. When the pod opens, this becomes so conspicuous and remarkable, as to give it a character quite different from the common Euonymus of the country. The gardener brought it to me as a great curiosity.

Cassia ——.

This is a very pretty shrub; and the leaves are used for those of *Senna*, to which they have a strong resemblance. Its natural size is three or four feet; but when trained against a wall, it rises to a considerable height, and is very ornamental. Several other species of Cassia are found in the East, though they do not appear to have been known or described by the ancients. The Κασία of THEOPHRASTUS,* and the Δελφινιον of DIOSCORIDES,† were very different plants.

Hedera Chrysocarpa.

THEOPHRASTUS ‡ describes two species of Ivy, distinguished by their colour, the *white* and the *black*. DIOSCORIDES,§ and PLINY,|| describe a yellow kind,¶ called *Dionysia* and *Poetica*, because it was that with which bacchants

* Lib. ix. cap. 5. † Lib. iii. cap. 84. ‡ Lib. iii. cap. 17.

§ Lib. ii. cap. 210. || Hist. Nat. Lib. xvi. cap. 34.

¶ The yellow-berried kind is also mentioned by THEOCRITUS in his 1st Idyll. v. 27-31.

and poets were always crowned, and *Chrysocarpa*, from the golden colour of the berries. The white has become extinct; but the black and the yellow still exist. It has been supposed, that the yellow is only a variety of the black; TOURNEFORT, however, who found it here, describes it as a separate species. "Les feuilles," says he, "sont d'un vert "plus gai que celles du lierre commun, et ses bouquets "couleur d'or lui donnent un éclat particulier.*" This is true; and the whole appearance and character of the plant is very different from the other. The seeds of the Hedera Chrysocarpa were formerly used in medicine, and taken internally for dropsy and hæmoptosis; a decoction, poured into the opposite ear, was applied as a cure for the *tooth-ache!* The juice of the recent berry was also taken as a remedy against the effects of intoxication. It is still sold in the herb-shops of Constantinople, and used by the *Hakims* medicinally; and the hard berry is inserted in issues. It is, however, a rare plant, and after a search of three years, I only found a single specimen, growing over the wall of an hospital in the vicinity of Pera. It is not noticed in the *Prodromus* to SIBTHORP's Flora Græca.

Prunus Cerasus; two varieties.

The first of these varieties is a Cherry of enormous size, that grows along the northern coast of Asia Minor, from whence the original Cherry was brought to Europe.† It is cultivated in gardens always as a standard, and by a graft. The gardens consist wholly of Cherry-trees, and each garden occupies several acres of ground. You are permitted to enter these, and

* TOURNEFORT, Voyage du Levant, tom. i. let. 12. † PLIN. Hist. Nat. Lib. xv.

eat as much fruit as you please, without payment; but if you wish to take any with you, you pay ten paras an oke, about a halfpenny per pound. The second variety is an amber-coloured transparent Cherry, of a delicious flavour. It grows in the woods in the interior of Asia Minor, particularly on the banks of the *Sakari*, the ancient Sangarius. The trees attain a gigantic size; they are ascended by perpendicular ladders, suspended from the lowest branches. I measured the trunk of that from which the seeds I send were taken: the circumference was five feet; and the height, where the first branches issued, forty feet; from the summit of the highest branch, was from ninety to one hundred feet; and this immense tree was loaded with fruit.

Phœnix Dactylifera.

A fruit-bearing branch of this tree was sent to me from Damietta, in Egypt, as a kind which is rare, and highly prized. The fruit was not ripe; but I was directed to cover the end of the branch with a piece of bladder, and hang the branch against the wall: the fruit, by this process, gradually ripened of a large size, and good flavour.

Platanus Orientalis.

The Turks, on the birth of a son, plant a Platanus; as they do a Cypress, on the death of one. In the court of the Seraglio is a venerable tree of this species, which, tradition says, was planted by Mahomet II. after the taking of Constantinople, to commemorate the birth of his son, Bajazet II., the trunk of which is fifty feet in circumference. There is another of more enormous size, at Buyukderé, on the Bosphorus; it

stands in a valley, and measures forty-five yards in circumference! It in fact now consists of fourteen large trees, growing in a circle from the same root, but separating at some distance from the ground. The Turks sometimes encamp here; and the *Bin Bashee* pitches his tents in the centre of this tree or trees. The immense size to which the Platanus attains, has been the wonder of antiquity: PLINY* describes several; in one of which LUCINIUS MUCIANUS gave a supper to a company of twenty-two friends.

Ricinus Communis.

The name of Κρότων, and Ricinus, was given to this tree by the ancients, from the exact resemblance of the seeds to a *tick*, or insect which fastens on dogs' ears—*Ricinus quasi auricanis.* It is called by the Arabs *Tebsche;* which, I believe, signifies the same thing. The seeds were prescribed by DIOSCORIDES;† and the expressed oil was used in lamps. Till very lately, this was the practice at Constantinople; and sometimes at this day the seeds are taken like pills, as a purgative, and are so violent in their operation, as to have obtained for the plant the name of the *Infernal Fig.* It grows in great luxuriance all over the barren rock of Gibraltar, where it attains a large size. It is found along the coasts of the Mediterranean, and as far as Constantinople; but it does not always ripen its seeds on the Bosphorus.

* Hist. Nat. Lib. xii. cap. 1. † Lib. iv. cap. 164.

Cistus Crispus.
—— *Creticus.*
—— *Salvifolius.*

These three shrubs cover all the hills in the islands of the Archipelago and sea of Marmora; they are gummiferous, and, in June and July, secrete copiously a very fragrant gum, which adheres to the goats' beards that browse on the plant, and is combed off, like the *Ladanum*, for which it is sometimes substituted. They are all distinguished by the *Hypocistis*, a succulent parasitic of a rich red colour, which I found growing from the roots, as described by Dioscorides.*

Poterium Spinosum.

This shrub is every where found with the above-named Cisti, and covers the hills with its prickly branches, like whin or furze in England. It must have been well known to the ancients; but whether under the name of Στοιβὴ, or Ποτήριον, is disputed.

Vitex Agnus-castus.

This fragrant and beautiful shrub is found on the banks of all the rivers of Greece and Asia Minor, in company with the Nerium Oleander. It was called by the ancients ἁγνος, because it was always carried by the priestesses in the feasts of Ceres.† There is a certain veneration attached to it at the present day. The Turks call it *Kef Marjam*, (the Hand of Mary,) and attribute to it many virtues.

* Lib. i. cap. 109. ‡ Plin. Hist. Nat. lib. xxiv. cap. 38.

Quercus Ægilops.
——— *Coccifera.*
——— *Pubescens.*

The first of these is distinguished by its large *cup.* When I passed through Asia Minor, in August, they were beating the trees with poles, to collect these cups, which are exported to Europe, for dying, under the name of *Valonía.* The second abounds in the islands of the Archipelago, and on the hills in the Bosphorus. The third is a fine and beautiful tree, the leaves are covered with down, and the branches, when young, are pendulous like willows.

Pinus Maritima.
—— *Pinea.*

These two species of Pine clothe the islands in the sea of Marmora. The cones of the latter are gathered, and sold in the markets. When exposed to the fire, they open, and the seeds, as large as hazel nuts, then drop out; they are eaten like nuts, and called by the Turks *Fistik.*

Lavandula Stœchas.

This fragrant and beautiful Lavandula covers the hills in all the islands of the Archipelago, and sea of Marmora; though it was originally called Στοιχας by Dioscorides,* from the Stœchades, now the Hieres Islands, near Marseilles, from whence it first came. It is very difficult to cultivate it in a garden.

* Lib. iii. cap. 31.

Ruscus Racemosus.

I am inclined to think that *this*, and not the Ruscus Hypoglossum, is the Δάφνη αλεξανδρεία, or Alexandrian Laurel, of Dioscorides.* He describes it as having *softer* and *whiter* leaves than the Ruscus, and the berries growing not *on* but *among* the leaves. This plant is found in the islands of the Archipelago, though it is not noticed in the *Prodromus* to the Flora Græca.

Kœlreuteria Paniculata.

This native of China I found growing in a garden at Sedikui, about ten miles from Smyrna. Hasselquist, the pupil of Linnæus, visited the place, and mentions a garden formed there by Sherrard the Botanist.† On enquiry I found that this garden was supposed to be that which he had planted. The Kœlreuteria, which he had obtained from China, probably was one of the very few exotics which now remain after him. I sowed some of the seeds in the British Palace garden, and they have succeeded very well.

Artemisia ———.

This is a pretty and very aromatic species of Artemisia, used in salads, and produced spontaneously in gardens. I am not sure of the species.

* Lib. iv. cap. 147. † Voyage, p. 51.

ESCULENTS, HERBACEOUS, ANNUALS, &c.

Erigeron Graveolens.

This is the plant described by DIOSCORIDES,* under the name of Κονύζα; its strong odour, clammy feel, and yellow flowers, &c. exactly answer his description. PLINY says it was used against the bite of serpents.† At present it is used against the bite of all manner of vermin, which its strong odour repels. It grows in large patches in the islands of the sea of Marmora, and flowers in autumn, giving a rich glow to the spots where it is found, when all other vegetation is parched and brown.

Pancratium Maritimum.

This beautiful flower is justly called by DIOSCORIDES Πανκρατίον,‡ or *all-excelling*. FORSKAL found it in great abundance in Palestine, and supposes it was the *Lily* of the Scripture, like to which, our Saviour said, "Solomon in all his glory was not arrayed." It grows in all the sandy plains of Asia Minor, and is propagated by seed as well as bulbs. I found it among the ruins of Teos, and am disposed to think it was the Lily of ANACREON.§

Arum Dracunculus.

I found it in the plains of Brusa; the flower attained to the height of four feet, the spatha edged with purple, and

* Lib. iii. cap. 136. † Lib. xxv. cap. 13. ‡ Lib. ii. cap. 203. § Odes, LI.

Mo. Bot. Garden,
1887.

the stem variegated like tortoise shell. I have called it Dracunculus, though I am not sure of its being that species. I transplanted it into the Palace garden in Pera, where it is now beginning to appear. I suspect it is the Δρακοντίον μεγάλον of DIOSCORIDES.*

Ferula ——

This large species of Ferula attains the height of eight feet, and covers the islands of the sea of Marmora like a forest of young trees. It is certainly the Ναρθηξ of DIOSCORIDES,† and the *Ferula* of PLINY;‡ the plant so well known, and so famous among the ancients. Its size, levity, inflammability, exuding a milky juice, &c. accord exactly with PLINY's description, and TOURNEFORT's amplification.

Phytolacca Decandra.

This plant seems to have been introduced into this country from America along with Tobacco; but it has now so accommodated itself to the soil, that it grows in all humid situations about the Bosphorus. The berries yield a rich purple juice, which was formerly used to colour red wine, but is now confined to Sherbet sugar, which the Turks manufacture of a rich red colour.

Cyperus Esculentus.

This is sold in the markets of Constantinople, being called by the Turks *Abdel assis,* and by the Greeks Μαννα. It is eaten raw, or made into a kind of conserve. The tuberous

* Lib. ii. cap. 196. † Lib. iii. cap. 91. ‡ Hist. Nat. Lib. xiii. cap. 22.

knobs of the root are the parts used. It is the Κυπείρος of Dioscorides,* which he describes as having an angular stem, knobs on the root like olives, and growing in a humid soil.

Centaurea Solstitialis.

This pretty plant is found sparingly on the hills about Constantinople.

Momordica Elaterium.

The peculiarities and properties of this curious plant were well known and described by the ancients. The name of Elaterium (ab ελαω) was given to it, according to Pliny,† from the powers the capsule possesses of ejecting its seeds, which it does with such force, as to endanger the eyes of a bystander, "etiam oculorum periculo." This property is very extraordinary. The plant grows in tufts, from which perpendicular foot-stalks issue, supporting on their summits the capsules, forming acute angles with the stalks. On the slightest motion these capsules detach themselves, and shoot out all their seeds with considerable force, so that a passenger is frequently struck in the face, by merely walking by the plant. The mechanism by which this is effected, is totally different from that by which the Impatiens, Cardamine, and other plants eject their seed, which they do merely by the elasticity of the valves of the capsule causing the parts to separate; but the capsule of the Elaterium is a tube, without valves, from whence the seeds seem to be projected by a process similar to that of shot from an air gun, namely, the expansion of some elastic fluid within the tube. Forskal

* Lib. i. cap. 4.

† Hist. Nat. lib. xx. c. 1.

justly remarks, "miro, nec adhuc investigato mechanismo, propelluntur semina."* The plant grows in abundance about Constantinople, and the inspissated juice is used here in medicine, as in England, but the Turks, Greeks, and Armenians, apply the capsule itself to a curious medical purpose: in cases of jaundice, they rub the interior membrane of the nose with the rough surface, till it excites sneezing, and they attribute some specific quality to this process, besides the mechanical excitement, for they suppose that sneezing caused by this plant, in particular, is highly beneficial in the disease. Dioscorides† directs the *juice* to be rubbed in the same manner for the same disease, so that it is probable that the practice is derived from him; the manner of preparing the Elaterium, or inspissated juice, is precisely the same as that which he directs. The plant is sometimes called here *Ass's Cucumber.*

Solanum Egyptiacum.
——— *Sodomeum.*
——— *Melongena.*

These plants, though now so abundant in the East, do not seem to have been known to the ancients; neither the Στρυχνον of Dioscorides,‡ or the Strychnum of Pliny,|| resembled them.

The first of them bears a bright scarlet fruit; and is a rare plant at Constantinople, never sold in the markets, and seldom met with in private gardens. It is used in soups. The second bears a large rich dark purple fruit, which

* Flor. Eg. Arab. 34.
† Lib. iv. cap. 255.
‡ Lib. iv. cap. 7.
|| Hist. Nat. xxi. cap. 105.

looks very inviting. It is sometimes punctured by a species of Cynips, which gangrenes the fruit, and converts the interior into a dry powder like ashes, while the outside retains its plump and beautiful aspect, and hence it is called the *Apple of Sodom.* Hasselquist found it on the shores of the Dead Sea. It is distinguished by spines on the stem and calyx. The third bears a long black fruit, of which there are several varieties in shape and colour. It is sold in the markets in almost as great abundance as Gourds and Melons, and used in the same manner in soups. It is called, by the Turks, *Palindjam;* and its first appearance in the markets is always attended with a strong N.E. wind, which for that reason is called, in the Armenian Almanack, *Patlindjam Melktem;* and all the ships bound for the Black Sea hasten to sail before the fruit appears in the market, and the wind sets in, as it continues several weeks.

Brassica Gongylodes.
——— *Eruca.*

The first of these has a protuberant swelling of the stem, from whence the leaves issue, and this is the only part of the plant used. The second is a fœtid, offensive plant; but highly esteemed by the Greeks and Turks, who prefer it to any other salad.

Hibiscus Esculentus.

This is very ornamental as a flower, but it is cultivated here for the fruit: the unripe pod is plucked, and stewed with sauce. It is sold in abundance in the markets, under the name of *Bahmia.* It is also dried for use, and preserved on strings.

Onopordum Elatum.

This fine Thistle adorns all the hills about Constantinople, and is ornamental when transplanted to a garden.

Papaver Somniferum.

This seed I gathered in a Poppy field in Asia, in a district famous for its Opium. The people were in the act of collecting the opium harvest: an incision was made round the capsule, from whence exuded a milky juice, which on the evening following became black and inspissated, and was scraped off with a crooked knife. The Οπον, or Opium, of DIOSCORIDES,* was obtained in the same manner, from the same plant, and taken exactly in the same quantity: the size of a pea.

Cicer Arietinum.

—— Lens.

The first of these is the Ἐρέβινθος of DIOSCORIDES,† and the Cicer of PLINY, who says, "est enim arietino capiti similis, unde ita appellatur."‡ It is called, by the modern Greeks, Ροβιθι; and, by the Turks, *Nohud.* It is used in great quantities in Constantinople, and mixed with all their dishes and pilafs, where it is always whole and never bruised. It is also used in great abundance parched, when it is called *Leblevi.* This operation is performed by Arabs, who have a peculiar skill in detaching it from the cuticle while toasting it. When prepared in this way, it is sold about the streets in sieves by the Arabs, who are called *Leblevigé,* and form

* Lib. iv. cap. 65. † Lib. ii. cap. 126.

‡ Hist. Nat. Lib. xviii. cap. 12.

a numerous body. The practice of parching this Pea is of great antiquity; it is not only mentioned by PLAUTUS* and ARISTOPHANES,† but SHAW supposes it to be the "parched "pulse" mentioned in Scripture.‡ The second species is not so abundant; it is called, by the Turks, *Mergimêts*. It is flattish on one side and convex on the other, and hence called *Lens*.

Phaseolus Nanus.
——— *Chonda.*

These are sold in great abundance in the markets, and called by the Turks *Beyas fasiula*, or *White Bean*, to distinguish them from Scarlet Runners; the larger is called *Chonda*.

Dolichos Lablab.

This is cultivated in all the gardens, but not sold in the markets.

Ipomœa Purpurea.
——— *Villosa.*
——— *Coccinea.*

These grow in Constantinople, with great luxuriance and beauty; they twine round pales and climb up trees, forming with their rich and varied flowers the brightest wreaths.

Amaranthus Hybridus.
——— *Caudatus.*

The first is a native, and grows spontaneously; the second is exotic: they both attain to a great size, altogether uncommon in England. The Amaranthus caudatus is trained by a pole, and rises to the height of six or seven feet, from

* Bac. 4, 7. Frictum cicer. † In Pace, ἀνθρακίτων τοὐρεβίνθου. ‡ 2 Sam. xvii. 28.

whence the pendant spikes of flowers hang down with great beauty, and are so long as sometimes to trail upon the ground.

Cucurbita Lagenaria.
——— *Claviformis.*

These are varieties of the same Gourd: the first exactly resembles a Bottle, the second a Club, which sometimes attains the length of six or seven feet. The ancients were fond of cultivating this Gourd; and PLINY* is minute in describing the mode and uses, which are the same nearly as at the present day. I imagine this to have been the real *Gourd of* JONAS. They grow rapidly when well watered, and wither immediately when left dry; in a few weeks forming dense, shady arbours, under which the people of the East sit and smoke. When the fruit is young, it hangs down inside the arbour, like candles; in this state it is cut, and boiled with forced-meat stuffed in the hollow part with rice; it is then called *Dolma* by the Turks; and is in such general use, that a large district in the vicinity of Pera is called *Dolma Bakché*, or the Gourd Gardens, from the cultivation of the plants.

Cucurbita Cidariformis.

The production of this Gourd, as given by the ancient writers, is curious: a Gourd was planted in Campania, in the vicinity of a Quince, and it immediately adopted its form in addition to its own. In fact, it resembles a large Quince laid on the top of a flat Melon. This curious fruit is called here *Turk's Turban*, which it resembles in shape and vivid colours. It is too rare to be sold in the markets; but is cultivated in private gardens, and used in soups.

* Lib. xix. cap. 24.

Cucurbita Aurantia.
——— *Pyriformis.*

These exactly resemble the fruit after which they are named; the one an Orange, the other a Pear. The first is called by the Turks *Portakal Cavac,* and the second *Arnirot Cavac.*

Cucurbita Potiro.

These are the Gourds most in use in Constantinople; they are heaped up in large piles, and kept under tents in the markets for six months in the year. There are two kinds or varieties: one long, with orange-coloured fruit; the other round, with white-coloured fruit. They are called by the Turks *Bál Cabaghi,* and used in all their soups.

Cucurbita Evadghi Cavac.

This is by far the largest Gourd in these countries; it is *quite white,* and in the markets resembles heaps of huge snow-balls, particularly so, as it is in season in winter. I do not know the species, but have called it by the Turkish name.

Seeds of several other Gourds are in the packet, exclusive of the above-described sorts.

Cucurbita Citrullus.

This is the famous *Water Melon,* so highly prized and universally used all over the East; it is the great luxury of the common people in Constantinople, and refreshes the *Hammals,* or porters, like ale in England, and tea in China. Strangers are warned by writers against the intense cold of this fruit; but the people of Constantinople devour it alone, without pepper or any other aromatic, in the hottest weather,

with perfect impunity. The Turks call it *Carpoos;* and give the same name to their artificial globes, from their resemblance to this fruit, which is a perfect sphere.

Cucumis Melo; several varieties.

The first six varieties of Melon sent are cultivated in Asia Minor, particularly about Angora, from whence I obtained seeds. There is one variety so very delicate, that the seeds were given to me carefully sealed up in a bottle, with directions that it should not be opened till the seeds were about to be sown, lest *the essence should evaporate!* The following directions were also sent, as to the time and manner of cultivation:—In the beginning of May the seeds are thrown into water; those that float are thrown away, and those that sink are suffered to remain twelve hours. The ground is chosen rich, and manured with pigeons' dung. A small cavity is made, in which several seeds are sown together; when they come up, three or four only of the most vigorous plants are suffered to remain, the rest are pulled up and thrown away. The fruit ripens in August, and is so rich, that no sugar or other seasoning is ever used with it.

The other kinds of Melon are cultivated about Constantinople, and most of them sold in the markets. They are called by the general name of *Cavún;* and, when they are larger or longer than usual, *Vodinà Cavún.* They generally sell for about twenty paras the oke, or about a penny per pound. One variety is called *Kiskaduo* by the Turks, and is much esteemed.

IV. *On the Cultivation of the* Madeira Vaccinium, *in the open Air. In a Letter to the Secretary. By Mr.* William Foulk, *Gardener to Sir* Everard Home, *Bart. F. H. S.*

Read December 7th, 1824.

Sir,

By the desire of Sir Everard Home, I send you the following account of the Vaccinium, cultivated in his garden at Ham.

This plant was introduced into this country from Madeira, and has been considered as a green-house plant, from which circumstance its fruit has been little known; nor, I believe, till now, considered an article of luxury at the table.

In the year 1819, it was planted in Sir Everard Home's flower garden at Ham, among the American plants, and stood the winter very well, bearing fruit in the following and every subsequent year. In the winter of 1820, it was cut a good deal by the frost, the thermometer having been as low as within 2° of zero, and seldom above the freezing point, during the nights of January, February, and March; but still it bore a small quantity of fruit in the subsequent October, which has increased in quantity till this year, when the crop was so abundant that the experiment was made of bringing it to table baked in a tart; its flavour is very delicate, and was preferred, by some of the company who partook of it, to the American Cranberry. The plant is of luxurious growth, and succeeds well in bog earth; the fruit is ripe early in October, so as to come in succession to Currants and Raspberries.

Should this plant, from the account I have given of it, appear to you deserving of more general cultivation, you will do me the honour of laying this communication before the Horticultural Society.

I am, Sir,

your very humble Servant,

William Foulk.

Ham,
November 21, 1824.

Note by the Secretary.

The Vaccinium above mentioned is generally known in the gardens and nurseries of England as V. Arctostaphylos; it appears, however, by the investigation of Sir James Smith in Rees's Encyclopedia, that that specific name properly belongs to the plant found by Tournefort, on the coasts of the Black Sea, and described as well as figured by him in his Voyage,* but it does not exist here in a living state. The name of Vaccinium Padifolium has been proposed by Sir James Smith as proper for the plant cultivated by Mr. Foulk. The Vaccinium represented in the *Botanist's Repository* (tab. 30,) as V. Arctostaphylos from Madeira, is probably erroneous, its appearance being very unlike that of V. Padifolium as cultivated in the Garden of the Society. Dr. Sims has given a figure in the *Botanical Magazine* (tab. 974) of a plant as V. Arctostaphylos, said to have been obtained by Messrs. Loddiges from Mount Caucasus, and which therefore may be the same that is described in Pallas's *Flora*

* Tournefort's Voyage, &c. vol. ii. page 223.

Rossica,* and which is considered identical with the Madeira plant, for no difference between them has been detected. It is so singular, however, that the same species should exist in countries so distant, and different from each other, without any connecting habitat, that a doubt of their identity may be reasonably entertained, which can only be cleared up by obtaining authenticated plants or specimens from the Caucasian country.

* Flora Rossica, vol. i. part 2, page 45.

V. *Report upon the* New or Rare Plants *which have flowered in the Garden of the Horticultural Society at Chiswick, from its first Formation to March* 1824. *By Mr.* John Lindley, *F. L. S. &c. &c. Assistant Secretary for the Garden.*

Read July 20, and August 3, 1824.

The following Report upon the New or Rare Plants which flowered in the Garden of the Horticultural Society, from the time of its first formation at Chiswick, up to March 1824, has been prepared for the information of the Members of the Society by desire of the Garden Committee. In selecting subjects for remark, I have confined myself to such as have been most particularly deserving notice, either for the beauty of their flowers or foliage, or for circumstances connected with their history; and I have attempted to avoid as far as possible entering into botanical discussion further than has appeared to be necessary in order to make this Report satisfactory. Although it has been the practice of the Society to exclude from its pages Papers in which Botany forms a principal feature, that rule could not have been followed in the present instance, without manifest injustice both to the Society itself, and to the individuals to whose liberality the Garden is indebted for many of the novelties which it possesses, and who have a just right to expect notices of their presents in the Transactions of that Society to which they have been contributed.

It is intended that a Report similar to this shall be made annually, to embrace all descriptions of plants, either hardy or otherwise, which may, during the year, appear to deserve notice. This, the *First Report,* is necessarily confined in a great degree to plants requiring some kind of artificial protection, the part of the Garden destined to the reception of hardy plants having only been commenced within a few months. The interest which would attach to the present communication is necessarily diminished by the previous description of the greater part of the plants in monthly Botanical publications, to which every remarkable subject is communicated as soon as it arrives at a state fit for description; it being the wish of the Council of the Society that the public should be made acquainted with all objects of interest with as little delay as possible. I nevertheless entertain a hope, that even under such unfavourable circumstances, some observations may be found which may be deserving attention.

In arranging the following notices, no other method has been followed than placing near each other plants of similar habits and character, dividing them generally into Tender and Hardy plants, and more particularly into such as are Shrubby, Herbaceous, Bulbous, or otherwise.

TENDER PLANTS.

Trees or Shrubs.

I. Calceolaria rugosa. *Ruiz and Pavon.*

C. crenata. Bot. Reg. 790, *not of others.*

II. Calceolaria integrifolia. *Ruiz and Pavon.*

Both these newly introduced species flowered last year in

the Garden. They are elegant small shrubs, with narrow, rugose, toothed leaves, and terminal clusters of bright yellow flowers. I believe it will be found that they are both nearly hardy, and it is certain that during the summer time they succeed much better in the open borders than under glass. *C. rugosa* was presented to the Society by the Directors of the Edinburgh Botanic Garden. *C. integrifolia* was obtained from seeds received from Chili by Francis Place, Esq. and presented by him to the Society. The former is figured in the Botanical Register, tab. 790, under the name of C. crenata, the latter at tab. 744 of the same work. They are propagated by cuttings placed under a hand-glass, in a cold frame.

In the Botanical Magazine, tab. 2523, the editor has unaccountably fallen into an error in supposing these two species to be the same, which if allowed to remain uncorrected might deprive the cultivator of the advantage to be derived from the possession of two distinct plants. They are not only different but dissimilar, as will appear from the following brief but comparative description of each.

In C. rugosa, the leaves are stalked, oblong-lanceolate, and toothletted irregularly along the margin, having a glabrous rugose surface. The flowers grow in little, nearly sessile, four or five flowered, terminal racemes. The lower lip of the corolla is a little plaited, and separated by a considerable interval from the upper lip.

In C. integrifolia, on the contrary, the leaves are nearly sessile, elliptical, rugose, evenly and partly regularly crenated along their edge, with an opaque pubescent reticulated surface. The flowers grow in many-flowered, terminal and axillary, long-stalked, cymose panicles. The lower lip is

closely pressed to the upper lip. The two cited figures in the Botanical Register are very characteristic of the plants.

III. Astrapæa Wallichii. *Lindley.*

A plant of what is supposed to be this species was presented to the Society by William Townsend Aiton, Esq. from His Majesty's garden at Kew, and flowered in the curvilinear stove. The heads of flowers were pendulous, not erect, as represented in the 14th plate of my Collectanea Botanica. Whether this difference between the cultivated and spontaneous plants is merely the effect of debility in the former, or indicative of a constitutional variance which may be expected to exist in different species, I am unable satisfactorily to determine. There are probably other species of Astrapæa in the East Indies and Madagascar, and I am inclined to think that it will be ascertained eventually that my Astrapæa Wallichii, and the Astrapæa Wallichii of the Gardens and of the Botanical Register are different. The plant from which the figure in the Botanical Register, tab. 691, was taken, is growing in the greatest luxuriance, and is one of the finest ornaments of the stove. It will be found to be easily propagated, for cuttings were struck in the Garden in the course of six weeks, by being planted in silver sand, without moisture.

IV. Laurus aggregata. *Sims.*

This is common in collections, under the erroneous name of *Laurus glauca.* It is a low branching shrub with oval, taper-pointed, three-nerved leaves, which are very glaucous beneath. The flowers appear in the winter months, in dense clusters in

the axillæ of the leaves, and are of a whitish-yellow colour. The perianthium is villous and six-leaved; the stamens seven, with 2-celled anthers. It therefore is not a species of Tetranthera, as has been conjectured, although LOUREIRO's Laurus Myrrha, to which this species is related, appears, from Mr. BROWN's observations, to be referable to that genus. It has been frequently imported from China by the Society, and is, I believe, a common plant upon the hills about Macao. It should be grown in three parts of strong turf-loam, and one of peat mould. A figure of the male plant, from a specimen in the Society's Garden, is in the Botanical Magazine, tab. 2497.

V. Guatteria rufa. *Dunal.*

Sent from the Botanic Garden, Calcutta, by Mr. JOHN POTTS, a most meritorious collector, who unfortunately died in the service of the Society, after returning from Bengal and China, in 1822. In the stove it is a low plant with rusty branches and oblong cordate leaves, covered with coarse pubescence underneath. The flowers are solitary, of a dull chocolate colour, produced but sparingly, but remaining open for many days. The plant is propagated with difficulty, and does not grow with much vigour. It has been figured in the Botanical Cabinet, tab. 612, from a plant communicated by the Society to Messrs. LODDIGES, and in the Botanical Register, tab. 836.

VI. Berberis fascicularis. *Sims.*

Berberis pinnata. Ker.

Mahonia fascicularis. De Candolle.

A fine plant of this very rare Berberis was presented to the

Society by Aylmer Bourke Lambert, Esq. and soon after flowered in a stove. It is a tall slender plant, in its present state producing scarcely any branches. The leaves are pinnated and prickly, and the flowers grow in axillary pendulous bunches, succeeded by a few dark-purple, roundish-oblong fruit. It has been figured in the Botanical Magazine, tab. 2396, under the name I have adopted, and in the Botanical Register, tab. 702, under the name of *B. pinnata.* No trial has yet been made of propagating the plant, which has been planted in the Arboretum with every prospect of its succeeding in the open air.

VII. Hypericum Cochin-chinense. *Loureiro.*

This plant has been introduced by the Society, from China, at several different times. It is a branching shrub, with slender shoots, and smooth, elliptical, stalked leaves, which are dotted on their under side. The flowers are small, of a dull red colour, appearing in small terminal racemes which have no bracteæ. It is one of the doubtful species of Hypericum, the station for which M. De Candolle has been unable, in his recent Prodromus Regni Vegetabilis, to ascertain. The very numerous stamens disposed in three distinct bundles, with large intervening glands, decide its affinity to those species of Hypericum which have been placed in a distinct section by M. De Candolle, and by him called *Tridesmos.* The plant is cultivated with difficulty in the green-house. It is common upon the hills near Macao, where it forms groves or thickets from ten to twelve feet high.

VIII. Diplolepis vomitoria.
IX. Diplolepis apiculata.

These two plants, one being the Asclepias Vomitoria of König's MSS. and the other nearly related to it, have been received from China by the Society at various times. The former is a twining plant with very villous stems, silky ovate sub-cordate leaves, and short, simple, or proliferous umbels of greenish yellow flowers. The second resembles the first in all points of structure and habit, but differs in having cordate roundish apiculate villous leaves, and in producing its flowers in much greater abundance. The parts of fructification of both species are very minute, and difficult to analyse; they appear, however, to differ in no other respect from the character assigned to the genus Diplolepis by Mr. Brown, than in having a flat, not rostrate, stigma. I have, therefore, referred them to that genus, with the following differential characters.

D. vomitoria; foliis ovatis acutis opacis cum caule undique sericeis, stigmate depresso.

D. apiculata; foliis subrotundo-ellipticis cordatis apiculatis lucidis cum caule undique villosissimis, stigmate depresso.

Both species are easily propagated by cuttings of the young wood, placed under a hand-glass in a warm frame. They require the temperature of a stove.

X. Cyminosma pedunculata. *De Candolle.*

Jambolifera pedunculata. Linnæus.

Gela lanceolata. Loureiro.

Ximenia ? lanceolata. De Candolle.

Plants of this interesting species were brought from China by Mr. Potts, in 1822. It has the appearance of a kind of Limonia, under which name it was received. The leaves are simple, but jointed with their stalk, opposite, oblong-lanceolate, obtuse, occasionally emarginate, quite entire and smooth, covered over with minute resinous dots, and giving out, when bruised, a strong smell resembling that of Cummin, or of some other umbelliferous plant. The flowers are small, yellowish green, and axillary, in corymbose racemes. The calyx is minute and four-toothed, the petals four with a valvular æstivation, a little spreading, narrow, and inserted round the base of the ovarium. The stamens are eight, hypogynous; those opposite the petals shorter than the others. Ovarium smooth, ovate, four-celled, with one pendulous ovulum filling up the cavity of each cell. Style straight, stigma two-lobed, with an obsolete division of each lobe. The fruit, which has not been perfected in this country, appears, from dried specimens in the possession of the Society, to be a superior, four-celled, somewhat fleshy pericarpium. All the specimens I have examined have universally been destitute of seeds, and a fruit which I remarked in the Society's Garden, in a half-formed state, was four-celled, but empty also. The nature of this portion of the fructification of the plant is therefore, at present, insufficiently ascertained, but the characters of the plant afford abundant evidence that it is referable to the *Jambolifera pedunculata* of Lin-

NÆUS and VAHL, and, consequently, to GÆRTNER'S genus *Cyminosma.* With the *Gel alanceolata* of LOUREIRO it also agrees in every particular, except in the nature of the fruit, which in *Gela* is stated to be a one-celled drupa. Whether the fruit of this plant, in a perfect state, assumes such an appearance, or whether it has been inaccurately described, it fortunately is not necessary to enquire, because it appears, as Mr. BROWN has kindly informed me, from LOUREIRO'S own specimens in the Banksian Herbarium, that his Gela lanceolata, and the Jambolifera pedunculata of LINNÆUS, are the same. The plant is propagated by cuttings, and is about as hardy as an Orange.

XI. Hæmadictyon venosum.

Echites nutans. Sims.

Echites sanguinolenta. Tussac.

This plant has been figured in the Botanical Magazine, tab. 2473, under the name of Echites nutans, by which it was introduced from the Island of St. Vincent's. The stem is twining, to the length of about twenty feet; the leaves are oblong-lanceolate, stalked, quite smooth, a little blistered, and beautifully traversed with crimson veins. The flowers are produced in smooth, axillary, nodding racemes, are of a dull yellowish green colour, paler in the centre. The calyx is fleshy, with five small revolute sepals. The corolla is salver-shaped, with a cylindrical tube, which is pilose inside, and a large reflexed limb, which is plaited between each of the rounded curled concave segments. In the inside of the tube are five scales alternate with the segments; and just under, and opposite the scales, are inserted the anthers, which are nearly smooth, sagittate, pointed, and

closely united into a cone, in which the capitate stigma is firmly enclosed; the ovary is double and distinct, with one filiform smooth style; at the base it is surrounded by five large white hypogynous glands, which alternate with the sepals. From the above description, which I hope to be excused for having made more than usually minute, it appears, that although this plant has many points of resemblance with Echites, yet that, on the other hand, it differs in too many essential particulars from that genus, to be considered the same. I therefore propose to call it Hæmadictyon, in allusion to the numerous blood-coloured veins of the leaves, which constitute the chief beauty of the plant; distinguishing it from Echites by the little scales of the throat, the regularity of the segments of the corolla, and the great hypogynous glands; from Holarrhena and Ichnocarpus by the same characters, and, in addition, by the difference in the form of their corollas. It is scarcely necessary to indicate the points in which Hæmadictyon differs from Apocynum and Cryptolepis.

This is a fine shewy stove climber, much esteemed for the singular beauty of its foliage. It is propagated by cuttings, and cultivated in common earth. It was sent to the Society, with many other curious plants, from the Botanic Garden, St. Vincent's, by Mr. GEORGE CALEY.

The essential character of the genus will be this:

HÆMADICTYON (αἱμα sanguis, δικτυον rete). *Squamulæ* tubi 5 inclusæ. *Cor.* hypocrateriformis: laciniis reflexis æqualibus dilatatis. *Stamina* inclusa. *Antheræ* sagittatæ, medio stigmate cohærentes. *Ovaria* 2. *Stylus* filiformis. *Glandulæ* hypogynæ 5, sepalis alternæ.

XII. Pergularia sanguinolenta.

A trailing shrub, agreeing in all essential particulars with the genus Pergularia, was raised from seed, sent from Sierra Leone, in 1822, by one of the collectors of the Society. It produced its flowers in July last. They grow in cymes, are of little beauty, and of a yellowish herbaceous colour. All parts of the plant, on being wounded, discharge a blood-coloured turbid fluid, analogous to the white milky sap of other plants of the same order. It grows freely in the stove, and is easily propagated by cuttings. It may be thus defined :—

P. sanguinolenta; foliis ovato-lanceolatis glaberrimis petiolatis, cymis multifloris folio brevioribus, corollæ laciniis acuminatis obtusis, succo sanguineo.*

XIII. Glycosmis citrifolia

Limonia citrifolia. Willd. Enum. 448. Dec. Prodr. 536.
Limonia parviflora. Bot. Mag. 2416. Dec. Prodr. 536.

This is a valuable plant. Although it has no beauty in its flowers, it is, nevertheless, continually covered with a profusion of small pale orange-coloured berries. These are smooth and semi-transparent; their skin is membranous, with a slightly resinous flavour, and tender juicy flesh of a lively sweetish taste. The seeds are solitary, or in pairs, dark brown, elegantly marked with the branched darker brown lines of the raphe. It is probable that the plant will be cultivated as a fruit for the dessert, for which the singular appearance of its

* Since this Paper was read to the Society the plant has been figured in the Botanical Magazine, tab. 2532.

berries, and their agreeable flavour recommend it. It was introduced for the Society from China in 1821, by Captain Jamieson, the commander of the Earl of Balcarras East Indiaman.

In the Botanical Magazine, tab. 2416, is a figure, from a plant of this species in the possession of the Society, under the name of *Limonia parviflora*, which has been adopted, as that of a distinct kind, by M. De Candolle. The species is, however, I know from authentic specimens, referable to Correa's genus Glycosmis, and to Willdenow and De Candolle's *Limonia citrifolia.* It may be increased by cuttings, or by seed, which it produces in abundance. In the Garden of the Society it is kept in the stove.

XIV. Ixora barbata. ***Roxburgh.***

This is a leafy, branching shrub, with long, flat, dark green leaves, and large corymbs of delicate white flowers, having a little tuft of hairs at the orifice of the corolla. It is nearly related to *I. cuneifolia* of Roxburgh. The plant was obtained for the Society, in 1822, from the Botanical Garden, Calcutta, by Mr. John Potts, and sent home by him. A figure of it has been published in the Botanical Magazine, tab. 2505. It may be propagated from ripened cuttings, struck in heat; but they root very slowly. It requires the protection of a stove.

XV. Lantana fucata. ***Ker.***

A beautiful small shrubby plant, covered with a profusion of delicate purple flowers during most of the summer months. It was raised from seeds collected for the Society in 1822, at Bahia de S. Salvador, and is a very distinct species, re-

quiring the heat of the stove, and is easily propagated by cuttings. The figure in the Botanical Register, tab. 798, was taken from plants which had been raised from seeds only a few months. As the plants become older they are less beautiful, and should therefore be frequently renewed from young cuttings, which strike root readily.

XVI. Euonymus Chinensis.

At several different times, this species of Euonymus has been imported from China by the Society. Its leaves are somewhat coriaceous, lanceolate, or obovate, bearing in the axillæ a few bunches of inconspicuous greenish flowers, which have not been succeeded by fruit in this country It is mentioned here, not as a plant remarkable for beauty, but as being one which will probably be found to be quite hardy It stood out last winter against a wall without injury, and it is now planted in the Arboretum. It is most nearly related to *Euonymus vagans* of WALLICH, from which, and also from *E. Japonicus* of THUNBERG, it differs in the outline of the leaves, and in their not being so coriaceous and regularly serrated, as in the latter species. Its specific character will be:

E. Chinensis, foliis obovatis obsolete crenatis sempervirentibus, cymis axillaribus paucifloris.

XVII. Clitoria arborea. *R. Brown.*

Plants of this fine species of Clitoria were received from the Botanic Garden of St. Vincent's, from Mr. GEORGE CALEY. It is a tall plant, bearing fine, large, ternate leaves, and racemes of flowers of a delicate purple colour, passing into white at the back of the vexillum. It has very little resem-

blance to a Clitoria in habit, and will one day, probably, be separated from the genus, which is otherwise perfectly natural. It is not easily propagated, but it grows well in equal parts of peat and fresh loam, and is a noble inhabitant of the stove.

XVIII. Oxalis Plumieri. *Linnæus.*

This, the only shrubby species of Oxalis in our gardens, was recently brought from the Botanic Garden at St. Vincent's to the Society, by Mr. James McRae. It is a neat little plant, not growing in the stove more than twelve or eighteen inches high, with bright green ternate leaves, and little yellow flowers, which are to be seen upon the plant during the whole year. Figured in the Botanical Register, tab. 810, from a plant which blossomed in the Comtesse De Vandes's collection at Bayswater. It is easily propagated by cuttings, and requires to be kept in the stove.

HERBACEOUS PLANTS.

XIX. Marica Sabini.

This is a magnificent species of Marica, sent by Mr. George Don, a collector then in the service of the Society, from the African Island of St. Thomas, in the year 1822. It rivals, in beauty of flowers, the well-known *M. Northiana*, to which it is in habit similar. The leaves are three feet high, ensiform, erect, towards the end cultrate, the scape about a foot longer than the leaves, and shaped like them, pushing forth from some distance below its end, a spathe-like horizontal raceme of four or five flowers, which open by pairs at intervals of two or three days, and emit a slight but agreeable perfume.

The flowers, when fully open, measure about three inches across, their outer segments are ovate, lanceolate, of a clear but powerful ultra-marine colour, at the edges and end whitish, at the base yellow, and crossed upwards by broken bands of bright brown; their minor segments are lanceolate, erect, recurved, not more than a third the size of the outer, above the middle bright sky blue, in the middle white, at the base cochleate, yellow, with broken brown spots. The annexed engraving of this beautiful plant is taking from a drawing made by Mr. CHARLES JOHN ROBERTSON.

The plant is wholly distinct from any other, and may be distinguished from *M. cærulea*, to which it stands next, by the following definition:

M. Sabini; foliis ensiformibus ad summam vaginam cultratis, scapo ultra flores longe producto, spathæ foliolis acuminatis alatis, perianthii lanceolatis: exterioribus majoribus.

The species has been named in compliment to Captain EDWARD SABINE, of the Royal Artillery, F.R.S. &c. to whom the Society is under much obligation, for the numerous and important services he, during his voyage to Africa and South America, in his Majesty's ship Pheasant, commanded by Captain DOUGLAS CHARLES CLAVERING, F. R. S. &c. rendered the Society, in the protection and assistance afforded the collector who accompanied him; whose mission, without such aid, would have failed to produce the extensively beneficial results expected from it. The *Marica Sabini* is easily propagated, and will consequently soon become, on account of the beauty of its flower, one of the finest ornaments of every stove.

XX. Lobelia campanuloides. *Thunberg.*

This was received from China, by the Society, in 1821. It is a pretty dwarf herbaceous plant, losing most of its leaves in winter, but is covered with flowers and bright green small foliage during the greater part of the summer. It is kept in the stove.

XXI. Canna Iridiflora. *Ruiz and Pavon.*

This very beautiful species of Canna was, for many years, almost solely in the possession of Aylmer Bourke Lambert, Esq. who originally raised it from seed, picked off some of Ruiz and Pavon's South American specimens. Notwithstanding the great care and skill with which it was cultivated, it appeared to resist all attempts at propagation, and even continued to live with great difficulty. In the summer of 1822, Mr. Lambert presented the Society with a plant, which grew vigorously for some time after its arrival at the Garden, but unfortunately died afterwards, in consequence of an alteration in its treatment. To repair the loss, Mr. Lambert, with his acccustomed liberality, again, in the spring of 1823, supplied the Garden with a plant, which was the last but one of his original stock. Very particular attention was paid to the management of such a treasure, and, fortunately with a result not less happy than unexpected. As soon as the plant was received, it was divested of all its mould, and planted in a 48-sized pot, in a mixture of old light leaf-mould and sand. It was then plunged to the rim of the pot in the tan bed. In a few weeks it began to grow vigorously, forcing its roots through the bottom of the pot, and pushing up suckers

in such abundance, that in three months the original plant had produced ten others. They continue to thrive in a remarkable manner, and seem to have acquired new vigour of constitution, for a plant turned out into the open border, without protection, although damaged a little by the spring frosts, is actually at this time shooting more luxuriantly than those in the stoves. Some were shifted, from time to time, into larger pots, in the mixture of earth above described, when the plants grew to so much larger a size than usual, as to raise a doubt in those who had been accustomed to see them in Mr. LAMBERT's stove, whether they were not *Canna gigantea,* rather than *Canna Iridiflora.* These two species agree in having downy sheaths and ribs to the leaves, but may be distinguished by the curled base and downy back to the leaf of *C. Iridiflora.* The figures, both in the Botanical Magazine, tab. 1968, and in the Botanical Register, tab. 609, are characteristic.* To make the plant flower well, it should be kept in a large pot, be well watered with liquid manure, and confined to a single stem.

XXII. Chlorophytum Orchidastrum. *Lindley.*

A fine species, sent to the Society in 1822 from Sierra Leone, by Mr. GEORGE DON, who accompanied Captain SABINE. It was cultivated for many months before it flowered, and, from its appearance, had been considered to be what the collector had called it, a species of Neottia, to which it bore a striking resemblance. The leaves are lanceolate, long, growing upright from the ground, and then spreading. The flowers are

* A figure of *Canna Iridiflora* has been since published in the Botanical Cabinet, tab. 905, by Messrs. LODDIGES, from a plant presented to them by the Society.

in a tall, very compound, stiff panicle, greenish white, and of no beauty. It has a remarkable resemblance in every thing but size to the original species of the genus, *C. inornatum.* It is cultivated in the stove in decomposed wood, and grows vigorously, but indicates no disposition to multiply. It produces seeds in abundance. It is figured in the Botanical Register, tab. 813.

XXIII. Ipomæa paniculata. *Ker.*

I am unable to distinguish from this species, two different plants received by the Society in 1822 and 1823, from Sierra Leone and Maranham, as the Jalap of those countries. Their roots are very large and fleshy, pushing forth one or two annual branches, which grow with great vigour to the length of twenty feet or more, and remain covered for several months with cymes of bright purplish red blossoms. Their leaves are lobed, and generally shaped as in *I. paniculata.* The plant from Sierra Leone differs from that from Maranham in having the leaves more deeply lobed, and in the tube of its corolla being shorter. These differences do not, however, appear sufficient to make it necessary to separate them botanically, though they certainly are not identical. Cuttings of them strike root freely in a mixture of sandy loam and peat, under a hand-light in a warm frame. Their roots should be kept dry through the winter, and re-potted in fresh mould in the spring.

XXIV. Aneilema Sinicum. *Ker.*

This pretty plant is usually cultivated in the stove, but, I believe, it is quite able to bear the temperature of a common green-house. It is a procumbent herbaceous plant with

many stems, narrow grass-like leaves, and a succession of bright blue blossoms. It was raised at the Garden from seeds received from China in 1821. A figure of it is in the Botanical Register, tab. 659.

XXV. Primula Sinensis. *Lindley.*

To this plant, one of the finest ornaments of the greenhouse, attention was first attracted by a drawing sent by JOHN REEVES, Esq. from China, to the Society, in consequence of which it was introduced three years ago, by Captain RICHARD RAWES, and presented by him to his relative, THOMAS CAREY PALMER, Esq. of Bromley, in Kent. It was for some time very scarce, but it is now become more common from the liberal distribution which has been made by the Society of plants obtained from seeds brought from China by Mr. POTTS. It is probable that it will soon be plentiful in every collection; for though scarcely more than biennial, and not readily propagated by cuttings, yet it produces seed in great abundance.

It has never been seen in this country in the luxuriant state in which it is represented in the Chinese drawings, but two varieties have been noticed, one, the state in which it produces fringed petals, and the other in which it produces plain petals. The former is figured in the Collectanea Botanica, tab. 7, being that which is represented in the Chinese drawing above mentioned; the latter has since been published by Dr. HOOKER, in his Exotic Flora, tab. 105.

XXVI. Limnocharis Plumieri. *Richard.*

A fine aquatic. It was raised from seed received in 1823, from Maranham, where it was collected in the preceding year

for the Society; it had not been previously introduced into Europe in a living state. It pushes up from its root, on long vascular stalks, several large elliptical leaves, which secrete water through a pore at their ends. The flowers are pale yellow, of a very delicate texture, and quickly perishable; they are disposed in umbels which are seated upon scapes the length of the leaves. The scapes bend downwards and the umbels consequently fall into the water after they have been in blossom a short time, and throw out roots at their base, as if about to produce fresh plants; this, however, does not happen, at least in this country. Seeds are produced in abundance, and by them the plant is easily propagated. It succeeds perfectly well in pots filled with common peaty soil, and plunged in the water of a cistern. It is a very ornamental aquatic, and well deserving a place in the stove of every good collection. It is represented in the Botanical Magazine, tab. 2525; but the figure in that work does not convey a just idea of the beauty of the plant.

XXVII. Phaylopsis longifolia. *Sims.*

A plant belonging to the same natural order as Justicia, of no great beauty, raised from seeds collected for the Society in Sierra Leone, in 1822. Its principal merit consists in being easily cultivated in a good green-house, and remaining in blossom nearly all the year round. The plant is an under shrub about one foot and a half high, closely covered with lanceolate, deflexed leaves, and bearing, in abundance, very dense imbricated spikes of whitish flowers, with a slight tinge of red. It is figured in the Botanical Magazine, tab. 2433. It may be propagated either from seeds, which it produces in abundance, or from cuttings.

XXVIII. Alströmeria Flos Martini. *Ker.*

A. pulchra. Sims.

However unwilling to accede to the alteration of a name once published, I cannot but agree with Mr. Ker in the propriety of rejecting the unmeaning name of pulchra, by which this plant has been published in the Botanical Magazine, tab. 2421, and adopting that of Flos Martini, by which it has been distinguished in the Botanical Register. In its native country it has been called universally *Flor de San Martin*, after one of the most respectable of the Independent commanders of that country. Roots, communicated by Mr. Place, flowered finely in the stove, and produced seed, from which young plants have already been obtained. It is a beautiful addition to our gardens, and by far the handsomest of the genus yet in the collections about London.

XXIX. Pitcairnia staminea. *Loddiges.*

This beautiful species of Pitcairnia was sent to the Society's Garden from Rio de Janeiro, by the late Mr. John Forbes. It is a rigid plant, with many narrow-pointed, scaly, whitish leaves, and a spike of brilliant scarlet flowers with recurved petals; the flowers are perishable, but the beauty of the plant is great.

The collection, of which this formed a part, is a good example of what skill and industry can effect. It is notorious that importations of seeds or plants from Rio have of late had so bad a reputation that collectors here universally consider them of little importance. The excellent, but unfortunate young man, however, from whom this was received, succeeded, during a very short residence, in getting together,

and safely transmitting an assemblage of living plants, small, indeed, but consisting entirely of either novel or extremely rare subjects, and, for its size, certainly one of the best collections ever sent to this country.

Pitcairnia staminea was first figured in Mr. LODDIGES' Botanical Cabinet, tab. 773, and since in the Botanical Magazine, tab. 2411.

XXX. Ocymum febrifugum. *Lindley.*

This, one of the fever plants of Sierra Leone, is a shrub, about three feet high, with the appearance of a common labiate plant. There is no beauty whatever in its foliage, but it is valuable, as being a plant with which the dangerous fevers of the coast of Africa are alleviated. It was sent home in 1822, by Mr. GEORGE DON, from Sierra Leone. A figure has been published in the Botanical Register, tab. 753. It requires to be kept in the stove, where it ripens seed in plenty.

ORCHIDEOUS PLANTS.

The Society has, by singular exertion, succeeded, in two years, in forming such a collection of this tribe of curious plants, as was never seen in Europe before. It consists at present of about one hundred and eighty species of tropical kinds.

Of the few which have flowered during the time upon which I am now reporting, the greater number are plants of interest.

XXXI. Catasetum cristatum.

This curious plant was brought to the Society in His Majesty's ship Pheasant, from Bahia de St. Salvador, in 1823.

It is a bulbous-rooted parasite, with many nerved, plaited, lanceolate leaves, and flowers of a green colour, growing in a strong spike, shorter than the leaves. The three upper segments of the flower are erect, the two lateral spreading; the labellum is spread open, with a little pouch at the bottom, and has its whole surface covered with gland-like tubercles. The columna has a pair of cirrhi in front. I have no hesitation in referring it to the genus Catasetum, notwithstanding the many anomalies in its structure. It may be thus defined:

C. cristatum; sepalis patentibus: superioribus conniventibus, labello cristato saccato expanso.

XXXII. Prescotia plantaginea. *Lindley.*

Another most singular plant, sent from Rio de Janeiro by Mr. Forbes, where it was found growing upon the decayed stems of fallen trees. The plant resembles, in foliage, an Ophrys, in flowers some kinds of Malaxis or Dienia; the latter are formed in a cylindrical compact spike; are of an herbaceous green colour, and remain long after their functions have ceased. The plant is quite new, very remarkable, and not to be confounded with any other kind. It is cultivated easily in the stove. It is figured in Dr. Hooker's Exotic Flora, tab. 115, where, in the letter press, it is called *plantaginifolia,* and upon the face of the plate, *plantaginea,* which latter is the name originally given to the plant.

XXXIII. Dendrobium squalens. *Lindley.*

Sent with the last from Rio de Janeiro, by Mr. Forbes. This new and curious species of Dendrobium was found growing upon decayed trees in woods. The leaves shoot up from

a bulbous base, are long, lanceolate, plaited, recurved; the flowers are in a spike, much shorter than the leaves, of a lurid purplish yellow colour. It grows in the stove with some difficulty in the soil in which such plants are usually cultivated. The figure in the Botanical Register, tab. 732, is expressive.

XXXIV. Ponthieva petiolata. *Lindley.*

A new species of a singular genus, and discovered in the island of St. Vincent's by Mr. James McRae. It is a terrestrial plant, with many fleshy fibrous roots, stalked, lanceolate leaves, and a scape about a foot high, terminated by several brownish flowers. It is very well figured in the Botanical Register, tab. 760, and is easily cultivated in the stove, growing in light peaty earth.

XXXV. Spiranthes pudica. *Lindley.*

Neottia australis β. Bot. Reg.

Roots of this pretty species were found among the earth of some plants received from China in 1821; it has not been imported at any subsequent period. It is a small delicate plant, resembling the *Lady's Traces* (Spiranthes æstivalis) of this country, but taller, with delicate flowers, slightly tinged with pink. It is very impatient of cold. In cultivation it requires a light soil, and suffers much from having its roots disturbed. Of several plants, once in the Society's possession, one only now remains, owing to their frequent division for the purposes of distribution among the Members of the Society. It has been published in the Collectanea Botanica, tab. 30. The statement in the Botanical Register, tab. 602, that it is the same species as *Neottia australis* of Mr. R. Brown, is a mistake.

XXXVI. Angræcum luridum.

Limodorum luridum. Afzelius.

Plants sent to the Society from Sierra Leone, by Mr. George Don in 1822, produced sufficient flowers to enable me to identify them with the *Limodorum luridum* of Afzelius, and to ascertain that that species belongs to the genus Angræcum. The plants arrived in a sickly state, but are now recovering in the stove from the effects of the voyage.

XXXVII. Eulophia Guineensis. *Brown.*
XXXVIII. Eulophia gracilis. *Lindley.*

Both these species, which are inmates of the stove, have been figured in the Botanical Register from the Garden of the Society, the first at tab. 682, the other at tab. 742. *E. Guineensis* is a plant with spikes of middle-sized white flowers, tinged with pink, rather difficult to cultivate, but flowers readily. *E. gracilis,* on the contrary, has long spikes of greenish flowers, grows very freely, blossoms in abundance, and is easily propagated. They were both sent to the Society by Mr. George Don, from Sierra Leone, in 1822.

BULBOUS PLANTS.

XXXIX. Ornithogalum corymbosum. *Ruiz and Pavon.*

A bulb from Chili, which proved, upon flowering, to be the species described and figured under this name in the Flora Peruviana. It is very like *O. Arabicum,* of which it is, perhaps, a mere variety; remarkable, however, for being a native of a country far distant from any in which *O. Arabicum* has yet been found. That it is wild in Chili cannot be doubted, both from the bulbs in question having been sent with other wild

plants indiscriminately collected, and because, although it is cultivated in the gardens of Peru, the authors of the Flora Peruviana expressly state their plant to be commonly wild in the provinces of Chancay, Cercado, and Huanuco. The Peruvian women entwine the flowers, which are very fragrant, in their hair. The Society was indebted for this and many other curious Peruvian and Chilian plants to the late JAMES COWAN, Esq. whose attention in promoting the interests of the Society in those countries was unremitting. His premature death on his way home, left us to regret the loss of a most valued correspondent.

XL. Pancratium patens. *Redouté.*

Bulbs of this plant were collected by Mr. GEORGE DON, in the island of Grand Cayman, and brought in the Pheasant to the Society in 1823. Before they flowered the plants were seen by the Hon. and Rev. Mr. WILLIAM HERBERT, who thought they might be his *P.* (Hymenocallis) *crassifolium*, a species only known by a brief description in his Appendix to the Botanical Magazine. Upon such authority bulbs of this species were sent to several friends of the Society, as the *P. crassifolium*. I am, however, informed by Mr. HERBERT, that his is a different plant. I therefore avail myself of the earliest opportunity of noticing the mistake, in the hope that this may catch the eye of those to whom this plant may have been sent as *P. crassifolium*. Upon flowering it proved to be *P. patens* of REDOUTÉ, which possibly is merely a variety of *P. Caribæum*.

XLI. Amaryllis Forbesii.

Many fine bulbs, some of them nearly as large as a man's head, of this new species of Amaryllis, were sent from

Delagoa Bay by Mr. John Forbes, whose untimely end we have lately had to lament. Some of the plants produced above thirty flowers of the most delicate pink colour. It is the handsomest of the genus with which I am acquainted, and in every respect a valuable addition to our collections. It has been named after its discoverer, whose zeal in the pursuit of science, talents, amiable disposition, and unhappy fate, call for every testimony of respect; all, alas! which now remains to be offered to his memory. The species is nearly related to *A. longifolia*, and may be thus defined:

A. Forbesii; umbella multiflora (30—40), foliis angustis canaliculatis debilibus glaucis ciliatis, tubo limbi campanulati longitudine.

The bulbs appear to flower freely, they are kept in the stove, but no seed has yet been obtained from them.

XLII. Amaryllis Cyrtanthoides. *Sims.*

A very beautiful bulbous plant, communicated by Mr. Place, with his other Chilian collections. The specimen which was produced was evidently imperfect, and the figure taken from it in the Botanical Magazine, tab. 2399, consequently represents the flower more distorted than it really was. It is a plant of delicate habit, growing in the stove, producing leaves very sparingly, and flowers still more rarely. The latter are of a brilliant scarlet, and their segments are rolled together into a tube, as in *A. ignea*, which comes from the same country. One would have thought this difference sufficient to have justified the formation of the plant into a distinct genus, but it is in all other respects so like *A. advena*, that no judicious botanist can do otherwise than pause before he decides upon their separation.

The Society is in possession of only one certain bulb of this plant; of others which have been received from Chili, under the name of *Maricalla* and *Pelegrino*, such as have hitherto flowered have proved to be *Amaryllis advena.*

XLIII. Amaryllis candida. *Lindley.*

This pretty species was sent from Peru to the Society by the late JAMES COWAN, Esq. The flowers are of the most delicate pure white, like those of a Crocus, and not fugitive. It has been referred to Amaryllis for the present. Whenever that genus shall be revised philosophically, I doubt not but that it will be separated from the species with irregular flowers; but whether it be a Sternbergia, or a genus *per se,* I cannot take upon me to determine. It certainly is not referable to Zephyranthes of Mr. HERBERT, from which it differs in the disposition of the perianthium to contract and expand under the influence or absence of light, in the regularity of the stamens, and in the innate insertion of the anthers, which are never versatile. The leaves are grassy. It seems to be quite hardy, and will doubtless grow in the open border, It increases plentifully by the root.

HARDY PLANTS.

TREES OR SHRUBS.

XLIV. Rosa Biebersteinii.

R. ferox. Bieberstein cent. pl. Ross.

Under this name it is proposed to distinguish the *R. ferox* of MARSCHALL VON BIEBERSTEIN. Plants presented to the Society from the Apothecaries' Garden, Chelsea, having flowered in the Society's collection, an opportunity has been

afforded of ascertaining, with precision, the real characters of this singular species. From M. Von Bieberstein's first description of it, under the name of *R. provincialis,* I was formerly induced to refer it, as an uncertain synonym, to *R. myriacantha* of De Candolle.* To that species it now proves to be nearly allied, distinguishable, however, by many satisfactory characters. It forms a low compact bush, covered with very numerous, small, glandular leaves, and, in the flowering season, with a profusion of pure white blossoms. Its branches are beset with many small setæ, resembling rusty glands, and, besides these, with strong falcate prickles immediately under the leaves. In general aspect it may be said to resemble *R. rubiginosa,* passing into *R. spinosissima.* At present it is very rare in gardens, but may be easily increased by layers, in the manner usually practised with Roses.

XLV. Prunus pseudo-cerasus.

P. paniculata, Ker, *not of Thunberg.*

This new species of Cherry was presented to the Society in 1822, by Mr. Samuel Brookes, of Ball's Pond, who imported it from China. It has also been sent to the Society from China by Mr. Reeves, under the name of *Yung To.* It differs from the common Cherry of the gardens in having its flowers growing in racemes, not fascicles; in their stalks being hairy; and, to a certain degree, in the outline of its leaves. Placed in a forcing-house, it ripened its fruit in fifty days from the time of flowering, and under circumstances unfavourable to forcing Cherries in general. Its fruit is small, of a pale red colour, of a pleasant subacid flavour,

* Rosarum Monographia, page 65.

with a small smooth stone. From the facility with which it bears forcing, it is to be anticipated that it may hereafter prove, an object deserving attention. A figure of it, in flower, has been published in the Botanical Register, tab. 800, under the name of *P. paniculata,* a plant which there is no reason to suppose has been yet introduced, and which has been compared by its discoverer to *P. Mahaleb,* bearing large panicles, not racemes of flowers. The following character will be sufficient to distinguish this species from others of its genus.

P. pseudo-cerasus ; foliis obovatis acuminatis planis serratis, floribus racemosis, ramulis pedunculisque pubescentibus.

ANNUAL PLANTS.

XLVI. Euphorbia cyathophora. *Jacquin.*

This was raised from seed sent from the Bahamas by John Campbell Lees, Esq. a Corresponding Member of the Society. It is also a native of Florida, and sufficiently hardy to live in the open air during the summer months : so treated it becomes annual, but in the stove it is perennial. It is a small plant, producing a few simple stems about a foot high, covered with dark glaucous green leaves, and terminated by other leaves of a brilliant scarlet colour, resembling a coloured involucrum. It is figured in the Botanical Register, tab. 765.

XLVII. Nicotiana repanda. *Willdenow.*

Seeds of this were brought from the Havannah in 1823, by Mr. George Don, as of the true Havannah çigar Tobacco. The plant is two feet high, with a nearly simple stem,

sparingly covered with stem-clasping, taper-pointed, sinuated leaves, and terminated by a few slender whitish flowers, which are a little purple at the back. The foliage is small, the leaves in no instance exceeding nine or ten inches in length, and their flavour is that of Tobacco, but delicate. No seed was produced, so that it is feared the plant at present is lost to the gardens. It is figured in the Botanical Magazine, tab. 2484.

XLVIII. Nicotiana nana. *Lindley.*

Seeds of this new and singular species were presented by James Bird, Esq. to the Society: they came from the Rocky Mountains of North America, as of a kind from which the Indians prepare the finest of their Tobacco. It is a very small, delicate, annual plant, never growing more than two or three inches high. The leaves are succulent, lanceolate, ciliated, and slightly hairy; among them a few white flowers, like those of *N. quadrivalvis*, are produced. The calyx is ciliated, and slightly viscid. The species is the smallest of the genus, with the exception of a doubtful kind described by Molina as a native of Chili, under the name of *Nicotiana minima*. The plant is very short-lived. It is figured in the Botanical Register, tab. 833. It has been called *Nicotiana nana*, and is thus defined:

N. nana; 2-3 uncialis, foliis lanceolatis pilosis radicalibus quam flores solitarii longioribus, corollâ calyce longiore: laciniis obtusis.

XLIX. Calceolaria scabiosæfolia. *Römer and Schultes.*

Although this species of Calceolaria is annual in the open garden, I think it probable that it is naturally perennial. In the open border it produces no seed, but propagates with

great facility from cuttings. In a pot, kept in a frame or green-house, it ripens seeds in abundance. During the summer it is quite hardy, but the first frost destroys it. It is an upright branching plant, with pinnate fleshy leaves, and terminal bunches of pale yellow flowers, resembling, in a striking degree, the old *Calceolaria pinnata.* The plant was raised in the Garden, from seed presented by Mr. PLACE, received by him from Chili. It is figured in the Botanical Magazine, tab. 2405.

L. Schizanthus pinnatus. *Ruiz and Pavon.*

The same collection of Chilian seeds from Mr. PLACE, to which reference has so often been made, produced an abundance of this beautiful annual. It bears few seeds in the open borders, and, in the green-house, is propagated by cuttings, which will strike root with careful management. It is thus, only, that the plant should be expected to be preserved. I know nothing more elegant, and, at the same time, singular, than its spreading lilac flowers, delicately spotted here and there with purple or yellow, and hanging, apparently without support, over a finely cut foliage of the most fresh and lively green. A good figure of it is in Dr. HOOKER's Exotic Flora, tab. 73. The *Schizanthus porrigens* of the same indefatigable botanist, Exotic Flora, tab. 86, is surely a mere variety of *S. pinnatus,* continually produced from seed of the latter.

LI. Schizopetalon Walkeri. *Sims.*

Another charming addition to our list of hardy annuals, from the same source as the last. The petals are white, and curiously cut; they only expand for a few hours, after which

they roll up and perish. But they appear in succession, so that their ephemeral beauty is perpetuated for many weeks. It is singularly unfortunate that all attempts to obtain seeds from this plant, or even to propagate it, have been attended with very indifferent success; so that it has now become extremely rare. It has been figured in the Botanical Magazine, tab. 2379, in Dr. Hooker's Exotic Flora, tab. 74, and in the Botanical Register, tab. 752. The specific name was given in compliment to the late John Walker, Esq. of Southgate, Vice President of the Horticultural Society at the time of his decease, a gentleman whose memory will be long cherished by all those who had the happiness to know him, and by every lover of Botanical Science. To him the Society was particularly indebted for numerous acts of kindness and attention during the long period which he continued a Fellow, and a Member of the Council.

LII. Œnothera tenella. *Cavanilles.*

An annual hardy plant with narrow glaucous leaves, nearly simple decumbent stems, and small purple flowers with a dark eye, formed by the deep colour of the stigmas and anthers. A native of Chili, for which the Society is also indebted to Mr. Place. The figure in the Botanical Magazine, tab. 2424, gives no idea of the really beautiful flowers of this species. It is not improbable, as suggested in that work, that the *Œ. Romanzovii* of Hornemann, and the continental gardens, may be the same as *Œ. tenella*. But the *Œ. Romanzovii*, published in the Botanical Register, tab. 562, is not different from *Œ. purpurea*. I had many opportunities of observing the plant which was, in 1821, called *Romanzovii*,

both in the Chelsea Garden, and in Mr. KENT's garden at Clapton, whence the figure for the Botanical Register was obtained, and I have no difficulty in declaring that it was scarcely distinguishable even as a variety from *Œ. purpurea.*

LIII. Ammobium alatum. *R. Brown.*

This plant was raised in 1822, from seeds transmitted from New South Wales, and presented to the Society by EDWARD BARNARD, Esq. It is a handsome plant, with many narrow white leaves, lying flat upon the ground, and an upright, winged, branched stem, bearing many white heads of flowers. It is a good addition to the class of flowers popularly called "*Everlastings.*" The plants grew and flourished vigorously in the open border, and, as they are evidently of a perennial nature, it was hoped that they would have been capable of surviving the winter. Slight, however, as the frost proved, the plant was not able to resist it, although protected by a hand-glass. It is, therefore, here considered only as a hardy annual. A figure of it may be found in the Botanical Magazine, tab. 2459.

LIV. Loasa nitida. *Lamarck.*

L. tricolor. Bot. Reg. tab. 667.

LV. Loasa Placei.

L. acanthifolia. Bot. Reg. tab. 985. not of Lamarck.

Owing to the very vascular and watery structure of the species of Loasa, it happens that specimens of them are preserved with great difficulty, and that, in the herbarium, the more delicate, and even essential characters of the species are wholly lost. It has unfortunately occurred that, with the exception of the unpublished species of the Flora Peruviana, nearly all the kinds described by botanists have been taken

up from dried specimens, in consequence of which much uncertainty is now experienced in referring the species, which have been raised in this country lately, to any of the kinds already published. Those now in the gardens are two, both obtained from a second collection of seeds presented to the Society in 1823 by Mr. PLACE. The *first* of these plants has been described as a new species in the Botanical Register, tab. 667, under the name of *L. tricolor*, but has been referred by both Dr. SIMS, in Botanical Magazine, tab. 2372, and Dr. HOOKER, in the Exotic Flora, tab. 83, to the *L. nitida* of LAMARCK. If the reasoning from which this conclusion has been obtained should appear to others, as it does to me, sufficiently satisfactory, the name of *L. tricolor* must be abandoned. It is a branching, upright plant, with pale green, lobed, stinging leaves, and bears great numbers of yellow flowers of a most curious conformation. This kind is in several collections.

The *second* species is at present in no other collection than that of the Society: it has been published, with a figure taken from the only plant which was in the Garden, in the Botanical Register, tab. 785, under the name of *L. acanthifolia* of LAMARCK; but independently of the greater stature of that species, which is said to be as high as a man, there are other reasons why it should be considered different from the plant now in question; it has therefore been proposed to name the latter after Mr. PLACE, whose name has been so often mentioned in this Report, and to whom the Society lies under many obligations for the great liberality with which he has communicated his fine importations of Chilian seeds, of which it may be truly said, that they either have been selected with more good taste and discrimination than any others which the Society has received, or that the country

from which they have been sent is so rich that there are none but fine plants to collect.

L. Placei is a more robust plant than *L. nitida,* with more pungent needle-like hairs, and larger flowers. The botanical differences in the two species are these:

In *L. nitida* the sepals are toothed and shorter than the petals, the wings of the corona very small, toothed, and stalked, the stamens much shorter than the petals, the style straight, shorter than the stamens, and the sepals erect, and much shorter than the pear-shaped capsule.

In *L. Placei,* on the contrary, the sepals are scarcely toothed, reflexed, and as long as the petals, the wings of the corona sessile, and quite entire; the longest of the stamens as long as the petals, the style bent, longer than the stamens, the sepals reflexed, and longer than the obovate capsule.

BULBOUS PLANTS.

LVI. Allium striatellum.

Ornithogalum gramineum. Sims.

In the year 1822, the Society received from Mr. PLACE, among his collection of Chilian seeds, several kinds of small bulbs which, in packing up, had not been separated. One of these blossomed, and was figured in the Botanical Magazine, tab. 2419, where it was called *Ornithogalum gramineum;* but as it is certainly an Allium, and nearly related to *Allium striatum,* Bot. Mag. tab. 1035, it is proposed to call it, with reference to the proximate species, *A. striatellum.* It is a delicate plant, with narrow, bright-green leaves, and a slender scape, so feeble as to be scarcely able to bear the weight of the few flowers with

which it is terminated. The flowers are of a pale, yellowish white colour, and small. The plant has no smell. It will, probably, thrive very well in a warm border.

LVII. Allium Cowani. *Lindley.*

This new species of Allium was received from Peru in 1823, from the late JAMES COWAN, Esq. It is closely allied to *Allium ursinum,* from which it is, however, botanically, as well as geographically, distinct. It produces, from the root, several long, succulent, ciliated, weak, flat leaves, among which arises a scape, bearing close clusters of white flowers. It increases very slowly by the root, and is at present exceedingly rare. A figure of it is in the Botanical Register, tab. 758.

LVIII. Amaryllis longifolia. *Ker.*

This has survived the last winter, in the open border, and is now growing and flowering luxuriantly. It is, undoubtedly, hardy, and is a most valuable addition to the list of border bulbs.

HERBACEOUS PLANTS.

LIX. Œnothera acaulis. *Cavanilles.*

This was raised from Chilian seeds, communicated to the Society by Mr. PLACE in 1823. It is a very dwarf plant, with whitish, divided leaves, and pure white flowers, which expand early in the evening, and remain open during the night, closing by nine o'clock the next morning. It is perennial, and, probably, very hardy, as it loses its leaves in the autumn, which the tender herbaceous plants of hot countries do not. As a border plant, it is one of the very best

which have been lately introduced. It has been figured in the Botanical Register, tab. 763.

LX. Senecio venustus. *Aiton.*

A handsome perennial plant, perfectly hardy, and easily cultivated. The leaves are chiefly radical, nearly upright, and finely divided. The flowers corymbose, standing about a foot and a half high, bright purple, and remaining long open. The plant was raised from seeds communicated to the Society by Mr. Frederic Otto, from the Royal Botanic Garden of Berlin, in 1822. It is a native of the Cape of Good Hope.

LXI. Calendula incana. *Willdenow.*

Plants of this were raised from seed sent to the Society by Mr. Christopher Abraham Fischer, from the Royal Botanic Garden of Göttingen. It is a hoary, branching plant, about two feet high, with whitish leaves, and beautiful pale yellow flowers, expanding in the bright sunshine, like those of some of the handsomest kinds of Mesembryanthemum. It is a native of the south of Europe and north of Africa, and quite hardy. It is figured under the name of *Calendula tomentosa,* in the Flora Atlantica of M. Desfontaines, vol. ii. tab. 245.

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VI. *On the Cultivation of* Strawberries. *By* Thomas Andrew Knight, *Esq. F.R.S. &c. President.*

Read December 21, 1824.

Mr. Keens has published, in the *Transactions of the Horticultural Society,** some excellent observations upon the proper modes of managing different varieties of the Strawberry; in conjunction, however, with some opinions which I do not think well founded: and as I rarely see in the gardens of my friends that which is, in my opinion, even a moderately good crop of Strawberries, I shall proceed to state some conclusions which theory and practice have conjointly led me to draw, relatively to the most advantageous modes of culture of those species and varieties of fruit.

I perfectly coincide in opinion with Mr. Keens, that the spring is the only proper season for planting. At that season of the year, the ground, having been properly worked and manured, will long continue light and permeable to the roots, which will consequently descend during the summer deeply into the soil. Abundant foliage will be produced, which will be fully exposed, through the summer, to the light; and much true sap will be generated, whilst very little, comparatively, will be expended; for if any fruit stalks appear, those should be taken off. In the following season, as Mr. Keens has justly observed, a superior crop will be borne, than by plants of greater age, or differently cultivated.

When plantations of Strawberries are made, as they usu-

* Vol. ii. page 392.

ally are, in the month of August, the plants acquire sufficient strength before winter to afford a moderate crop of fruit in the following year: but the plants will not have formed a sufficient reservoir of true sap to feed even such a crop, without being too much impoverished; their spring foliage will be also exhausted in feeding the fruit, and will continue, through the summer, to shade the leaves subsequently produced. The aggregate produce in two seasons will, in consequence, generally be found to be less in quantity, and very inferior in quality, to that afforded in one season by a plantation of equal extent, made in the spring.

Mr. Keens suffers his beds to continue three years, though he admits that the produce of the first year is the most abundant, and of the best quality; and in order to afford his plants sufficient space, when they are three years old, he places them at too great distances, in my opinion, from each other, to obtain the greatest produce from the smallest extent of ground. He places his Hautbois and Pine Strawberry plants at eighteen inches apart in the rows, with intervals of two feet between the rows; each square yard consequently contains three plants only. I have placed Downton Strawberry plants, which require as much space as those of the Hautbois, or Pine, in rows at sixteen inches distance from each other, and with only eight inches distance between the plants; which is nearly nine to each square yard; and I have found each plant at such distances nearly, if not quite, as productive, as when placed with much wider intervals. The Old Scarlet Strawberry I have also found to bear admirably when plants have been placed in rows of one foot distance from each other, with spaces of half that distance

between the plants; and I think I have obtained more than twice the amount of produce from the same extent of ground, which I should have obtained, if my plants had been placed at the distances recommended by Mr. Keens. My beds are, however, totally expended at the end of sixteen or seventeen months, from the time of their being formed, and the ground is then applied to other purposes. I have consequently the trouble annually of planting; but I find this trouble much less than that of properly managing old beds; and I am quite certain that I obtain a much larger quantity of fruit, and of very superior quality than I ever did obtain, by retaining the same beds in bearing during three successive years, from the same extent of ground.

There is a very large Strawberry of most luxuriant growth raised from seed by Mr. Williams of Pitmaston, called the Yellow Chili, which will alone, of those varieties which I have cultivated, require, in my opinion, wider intervals than those I have mentioned; and the distances recommended by Mr. Keens will, I think, be found expedient, where that variety is cultivated. It is a variety of much merit, and of most extraordinary size, a single fruit, raised in my garden, in the last season, having weighed 558 grains. Some plants of it were sent by Mr. Williams to the Society's garden in the last spring.

I perfectly approve of, and have long practised, the mode of management recommended by Mr. Keens, of placing some long dung between the rows, where it has all the good effects which he ascribes to it; but to his practice of digging between the rows I object most strongly; for by shortening the lateral roots in autumn, the plants not only lose the true sap, which

such roots abundantly contain; but the organs themselves, which the plants must depend upon for supplies of new food in the spring, must be, to a considerable extent, destroyed. This mode of treating strawberry plants is much in use amongst country gardeners, and I have amply tried it myself, but always with injurious effects; and I do not hesitate to pronounce it decidedly bad.

The wide intervals recommended by Mr. Keens certainly permit the fruit to be gathered with much convenience, but spaces, to receive the feet of the gatherers of the fruit may be easily made; and it is much better that a small number of Strawberries should be destroyed, than that a large quantity should fail to be produced, owing to more than necessarily wide, void spaces.

Taking off the runners is not expedient in the mode of culture I recommend, and, under all circumstances, this must be done with judgment and caution; for every runner is, in its incipient state of formation, capable of becoming a fruit stalk, and if too great a number of the runners be taken off in the summer, others will be emitted by the plants, which would, under other circumstances, have been transmuted into fruit stalks. The blossoms, consequently, will not be formed till a later period of the season, and the fruit of the following year will thence be defective alike in quantity and quality: and, under the mode of culture recommended, a large part of the runners, when these are taken off in the spring, will be required to form the new beds.

I have found the Alpine Strawberries to succeed best, when seedling plants, raised very early in the spring, or those obtained from runners of the preceding year, have been

planted in the beginning of April, at one foot apart, in beds of about four or five feet wide, with intervals between the beds. It is expedient, in the culture of these varieties, that the superficial soil should be extremely rich; because much the most valuable part of their produce is obtained from runners of the same season, and these require to be well nourished. If a good Alpine variety be planted, the blossoms of all the runners will rise with the third leaf. The best which I have seen, affords a white fruit, similar, in form, to the red variety; and the old plants of this, as well as the runners, continue to bear till the blossoms are destroyed by frost: and both the White Wood and White Alpine Strawberries, appear to me to retain their flavour more perfectly in autumn than the Red. The habits of the White Alpine variety abovementioned, of which I have sent plants to the garden of the Society, are permanent in the seedling plants; provided the seed be grown at some distance from plants of the coloured varieties of the same species.

Mr. Keens supposes the Alpine Strawberry plants to be incapable of producing blossoms till they are a year old; but I have shewn that they afford fruit in a very few months after they have sprung from seeds. He also supposes that the seedling plants of other species of Strawberries do not produce fruit till they are two years old. I entertain no doubt but that he is correct, when the plants are raised in the open ground; but when I have employed, as I have always done, artificial heat, early in the spring, I have obtained abundant crops from yearling plants of every species.

VII. *Directions for Managing* Tigridia Pavonia, *during the Winter Months: In a Letter to the Secretary. By Mr.* JOHN DAMPER PARKS.

Read December 7, 1824.

SIR,

MUCH is yet to be learned respecting the method of treating many plants, although they have been long cultivated in the gardens of this country; and it is only by the result of repeated experiments that this object can be attained. I consequently beg leave to lay before you a plan that I have successfully adopted for the *management of the Tigridia Pavonia,* during the winter, which differs from the usual treatment of that plant.

It is customary with gardeners, in general, when the flowering stems have been damaged by the autumnal frosts, and have began to decay, to cut down the entire tops of the plants, to take up the bulbs, and having cleaned and gradually dried them, to place them for the winter in some dry situation, where they will be safe from the effects of frost. But I have found that by this treatment the roots not only diminish in size, but the stock is reduced in quantity, for they are apt to become mouldy at the base of the bulb, and then to rot.

Having experienced in the year 1821, particularly, the ill effects of the usual mode of treatment, I resolved, for experiment sake, to preserve a part of the mould round the roots of the plants when first taken up in the

autumn, and to place them in pots, as small as their size would conveniently admit without disturbing the bulbs. I then arranged them between the heaths in a cold pit, which was erected solely to exclude frost, there being no flue attached to it, and I kept the pots repeatedly watered through the winter, whenever the mould appeared to be getting dry. When I examined them for potting, previously to their being put into the Cucumber frame, in order to bring them forward in the month of March following, I was surprised to observe the difference in size between the roots so treated and those that had been kept dry; also that, though many of the latter had perished, there were no symptoms of decay in those that had been preserved in a moist state.

I afterwards remarked, throughout the summer, that the luxuriant growth of the plants, so treated, as much surpassed those that had been kept dry, as the appearance of the bulbs excelled at the time of potting.

As the Tigridia Pavonia is a plant much admired, and now generally cultivated, I have ventured to communicate to you these particulars, in case you should think them worthy of the notice of the Horticultural Society.

I have the honour to be

Your most obedient servant,

JOHN DAMPER PARKS.

Bexley, November 24, 1824.

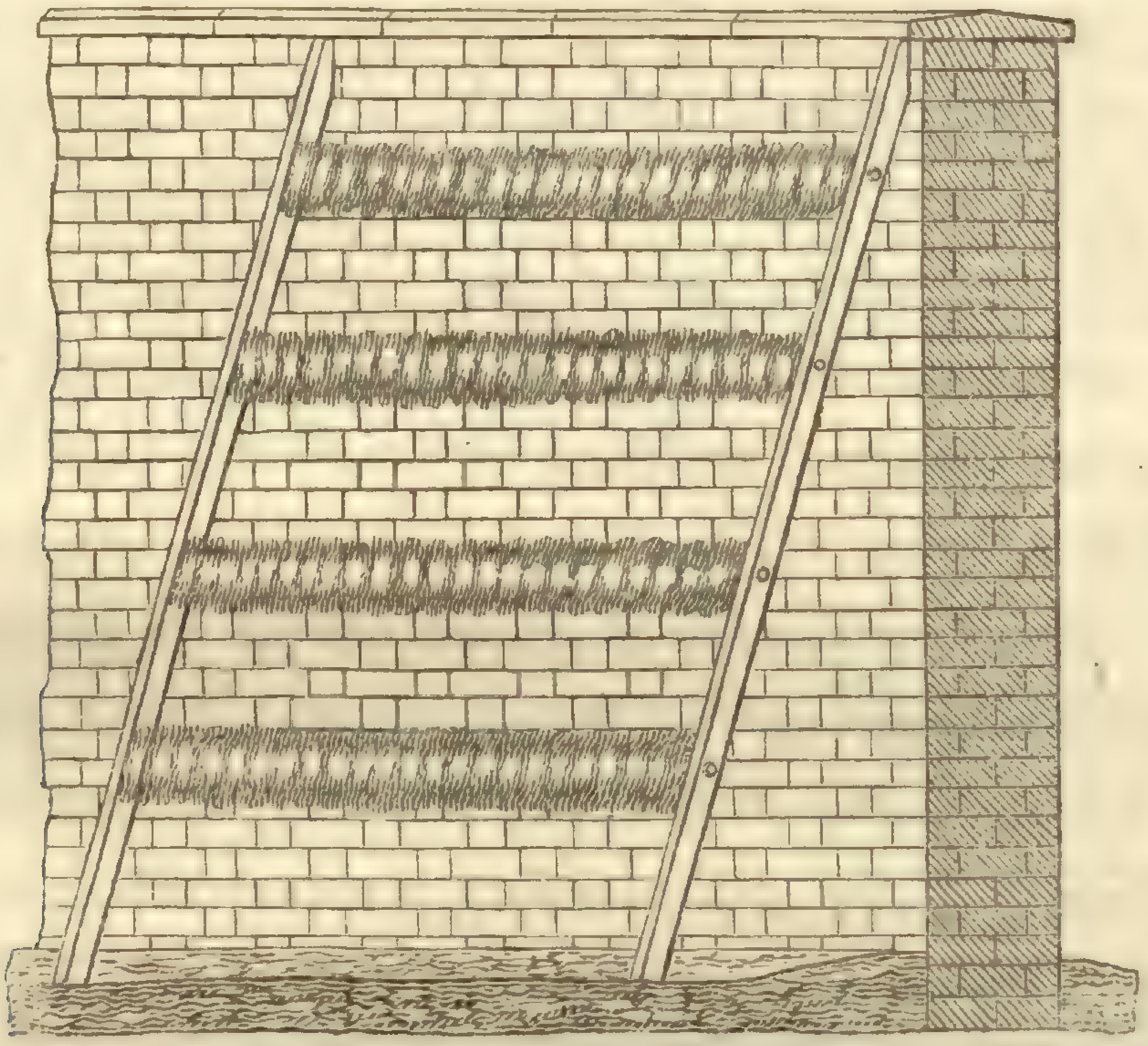
VIII. *Notices of Communications to the Horticultural Society, between January* 1, 1822, *and January* 1, 1823, *of which separate Accounts have not been published in the Transactions. Extracted from the Minute Books and Papers of the Society.*

THE Reverend GEORGE SWAYNE of Dyrham, near Bath, communicated to the Meeting, on the 5th February, the following method of *protecting the branches of Fig-trees during winter*. He had observed, that wherever the fruit-bud of a Fig tree was enclosed within the woollen shred by which a branch was fastened to the wall, the young Fig issuing therefrom was subsequently generally forwarder and stronger than others on the same branch which were exposed. From this he was led to believe, that if the fruit-bearing part of the branch was wholly enclosed in some slight covering during the severe part of the winter, its produce would probably be preserved from the injurious effects of frost, and the future growth of the fruit materially accelerated. He consequently adopted a plan of covering, which proved successful. The materials which Mr. SWAYNE has used, and found to be most proper for the purpose, are old newspapers; they are thin enough to admit a portion of light, which he considers to be of importance, and by being fabricated of lint or cotton, which are bad conductors of heat, they so far resist the cutting blasts and cold of the winter nights. Printed, he conceives, is better than plain, paper for the purpose; for having a considerable

portion of its surface covered with the oil of the ink, it does not readily imbibe moisture. To allow full time for ripening the wood, Mr. Swayne does not cover the branches till the month of December, unless the weather threatens to be frosty. The most expeditious mode of applying the paper is by winding long stripes round the branches, in the manner in which surgeons do their bandages, making the paper reach as far as possible, without leaving any part uncovered, and giving it a twist on the end, to fix it. As soon as the branch has been papered, it is attached to the wall with shreds in two places, one at the commencement of the paper, and the other near the end. Towards the latter end of April, when the young fruits are swelling, the covering is removed, taking care to do so on a mild but cloudy day, that the change may not be too great from their covered state to that of exposure. If the Fig trees have not been previously pruned, to save unnecessary labour, such branches only as are intended to be left for fruiting need be covered.

The Rev. William Phelps, of Mellifont Abbey, near Wells, Somersetshire, communicated to the Meeting, on the 5th of February, directions for protecting wall trees from the effects of frost, by constructing broad ladders, resembling hurdles, of a length sufficient to reach to the top of the wall when placed obliquely against it, three feet distant at the bottom, and of a width not exceeding six feet, in order that they may be more portable. The rounds of the ladder, which are eighteen inches apart, are wrapped with straw or hay-bands, or with refuse flax, or hemp dressings. The annexed

sketch will convey a perfect idea of the machine recommended.



The obliquity of the ladder brings the rounds into such a position, one above the other, that the effects of frost, and of cutting winds, are completely guarded against, and yet the sun's rays are admitted, and a free circulation of air allowed. The ladders are placed in front of the trees, just before the blossoms begin to expand, and continued there till the fruit is of good size, when they may be removed to a shed, to remain till the next season. With common care they will last several years, and the straw or hay-bands may be easily renewed. The experience of four years has fully confirmed Mr. Phelps in the opinion of the utility of this kind of protection.

Mr. James Dall, Gardener to the Earl of Hardwicke, at Wimpole, in Cambridgeshire, transmitted to the Meeting, on

the 19th of February, a Description of *Pine-Pits, worked without fire or dung heat.* The pits are somewhat on Mac Phail's plan, but adapted by Mr. Dall to the culture of Pines; the outside of the pits is surrounded with a mound of leaves five feet and a half thick, five feet high in front, and seven feet at the back. As the leaves settle, additions of fresh leaves are made, to keep up the height of the mound, which requires neither turning nor changing for a twelvemonth. After that period, the leaves are removed for forcing Asparagus, Sea Kale, &c.; and in the third year they become vegetable mould. The length of the Pinery is one hundred and sixty feet, and there are seven hundred one-horse cart loads of leaves gathered yearly, which produce three hundred cubic yards of vegetable mould. From the stock of Pine plants (which are in number from five to six hundred,) there are two hundred and fifty fruit cut annually. At the time of making the communication, Mr. Dall had practised this mode of raising and fruiting Pines for four years, and has since continued it with the greatest success.

Mr. James Smith, Gardener to the Earl of Hopetown, at Hopetown House, in Scotland, communicated, in a Letter to the Secretary, read at the Meeting on the 19th of March, *a method for forcing Rhubarb.* In the last week of December he takes up roots of the Rheum hybridum, with the fibres as little broken as possible, and plants them in a light soil, in boxes three feet long, one foot eight inches wide, and one foot three inches deep, as close together as possible. The boxes are placed in a Mushroom-house, or other dark room, and watered occasionally. If the temperature of the place be from

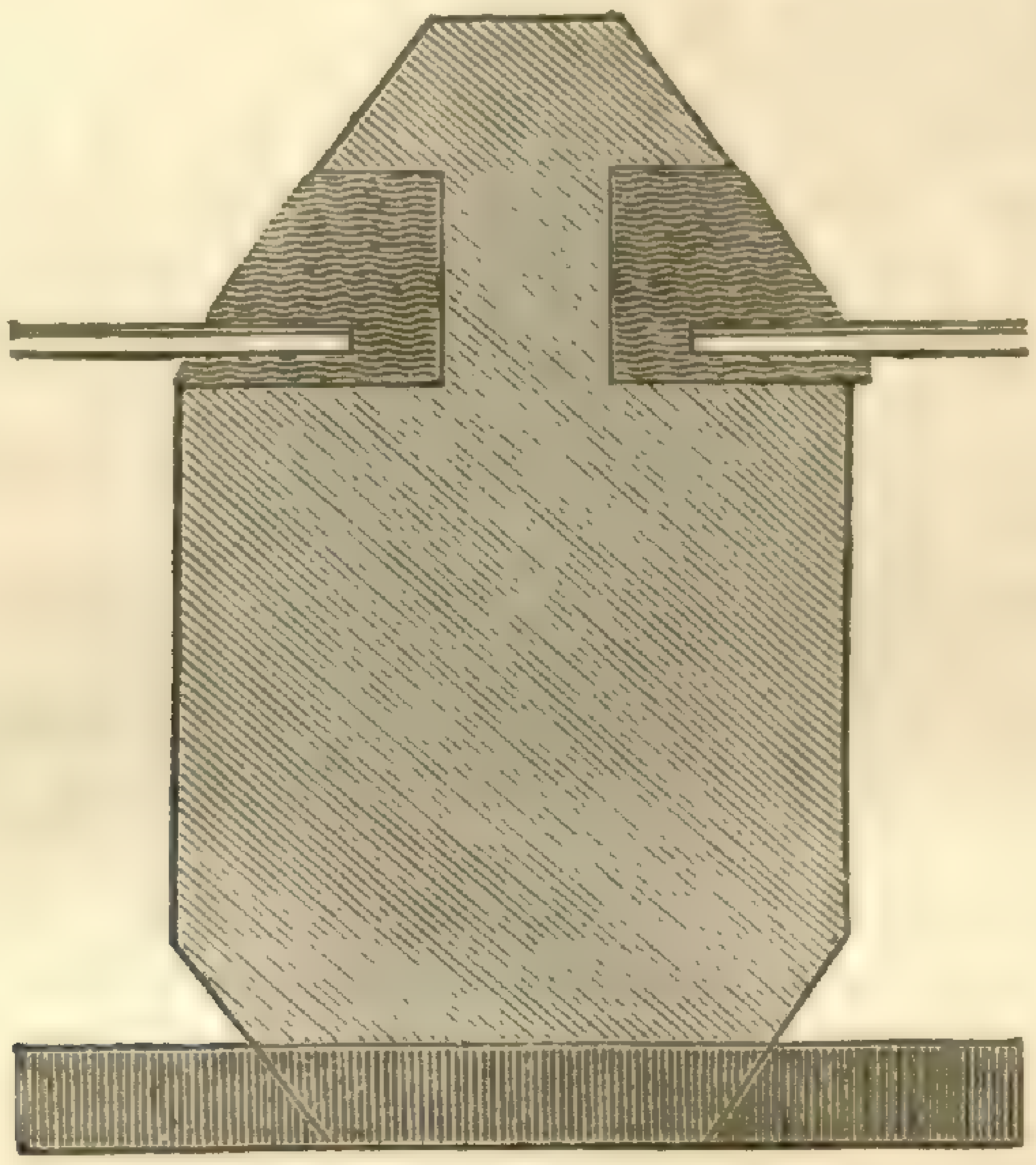
55 to 65 degrees, the shoots will grow, become blanched, and be fit for cutting in February. If a fresh box be brought in every three weeks, a regular supply for an ordinary family will be easily obtained. In April, when the plants are done with, they are to be taken out of the boxes and planted in the open ground, and if they have not been too much exhausted, they will become fit for future similar use. Mr. SMITH was led to adopt this plan in consequence of reading that described by the President in the third volume* of the Transactions of the Society.

JOHN WEDGWOOD, Esq. sent for the inspection of the Society, on the 16th of April, some Specimens of *Buda Kale, blanched in the manner of Sea Kale.* The blanching is effected simply by covering the plants with garden pots, about the beginning of March. If dung is applied, they may be covered much earlier, and forced, as is usual, with Sea Kale. The plants thus treated become peculiarly delicate.

Mr. JOHN READ, of Newington Causeway, Southwark, late of Yalding in Kent, communicated, in a Letter to the Secretary, a sketch and explanation of *a mode of glazing hot-bed lights, and the roofs of forcing houses.* Mr. READ observes, that in the usual way, the surface of the putty being entirely exposed, soon loses its tenacity, and partially separates from the bar, thereby admitting wet into the house, and hastening the decay of the wood. To obviate these defects, Mr. READ's sash-bar has a groove on each side, to receive the glass and putty, and the top is planed off, leaving it slanting both ways,

* See Horticultural Transactions, vol. iii. page 154.

as is shown in the annexed sketch, which is a section of the bar and glass.



There is not more difficulty in repairing the glass in lights or roofs with bars of this form, than in those made in the usual way, as a narrow chisel, like a mortice chisel, cuts out the old putty with great ease.

Mr. John Hunneman sent to the Meeting, on the 18th of June, several *roots of the Teltow Turnip,* a small and excellent spindle-shaped root, not exceeding the size of a small long-rooted Radish, grown principally in the neighbourhood of Teltow, in Brandenburgh. Mr. Hunneman, at the same time, communicated the following account of its cultivation. The seed is sown twice a year, the first time in April, and the crop is fit to gather about July, or sooner, if the season be favourable. The second sowing is made in August, generally in ground from which the Rye crops have been cleared, or where early Potatoes have been previously grown. This second crop is taken up late in the autumn, and after the tops and fibres are trimmed off, the roots are preserved in

cellars in dry sand, where they will keep good till the spring. The poor and sandy soil of the Teltow district seems almost necessary for the growth of this Turnip, for it degenerates when grown at a distance from it. A total absence of manure is essential to their perfection. As a vegetable it is much used in Germany; it is of great excellence, and is dressed in a variety of ways, but generally stewed.

Sir Charles Miles Lambert Monck, Bart. communicated to the Meeting, on the 16th of July, *Directions for removing Worms from the roots of plants grown in pots or tubs.* He had observed, in the month of August, that some Tuberoses, which grew in pots under glass, and, having thrown up tall flower stems, had begun to open their flowers, suddenly became sickly, and declined in vigour. Abundance of worm casts, chiefly of very young and small worms, appeared on the surface of the mould in the pots, which led him to believe that worms might be the cause of the sickness; he therefore directed a pint of an infusion of Walnut leaves to be given to each pot: the worms quickly emerged from the mould to the surface, and were removed. This treatment was repeated in the following week, when a few more worms were extracted; the plants subsequently resumed their health, and blossomed strongly. This success induced Sir Charles Monck to try the experiment on Orange trees and other plants in pots, and it was attended with equal success. He thinks that, the infusion is beneficial not only in destroying the worms, but that it acts also as a manure, the season for extracting the worms being the same, when the plants are in full growth, and therefore most in want of moisture and

manure. The infusion is made with boiling water and fresh Walnut leaves: having stood till cold, it is ready for use.

Mr. Peregrine Day, Gardener to the Countess of Dysart, at Ham House, near Richmond, sent to the Meeting, on the 16th of July, *a Tree Cabbage-plant* in seed, the stem of which was twelve feet high, with abundance of branches. On the 6th of August Mr. Day communicated the following particulars respecting it: He had heard from one of his under-gardeners that he had seen a variety of Cabbage in Sussex, which grew to a great height, and through his means he obtained some of the seed, which he sowed in the garden at Ham House in March 1821, in the ordinary soil. Only one plant came up, which was planted out in the usual manner. During the following winter the produce of sprouts from this was very abundant; it put forth flowers, which were white and very large. In July 1822, when the plant was sent to the Society, it had ripened abundance of seed.

Mr. James Smith, Gardener to James Hammond, Esq. at Potter's Bar, near Barnet, communicated to the Meeting, on the 6th of August, *Directions for forcing Onions to produce bulbs in clusters, at an early season.* He sows the seed in April, thickly, in a bed, and does not afterwards thin the plants which come up; this causes them to remain small, a part of them are used for pickling, and the remainder being about the size of walnuts are planted in January or February, pressing each Onion into the earth so deep, as just to cover

it. As soon as the seed-stalks appear, he breaks them off, and instead of making any effort to form new ones, the Onions begin to form young bulbs round the old ones. By this process, Onions may be obtained two or three inches in circumference, fit for the kitchen early in the spring, at a time when spring-sown Onions are not larger than quills. Onions thus thrown into clusters will be full grown by the end of June, and fit to take up then, but they do not keep well.

Peter Rainier, Esq. Capt. R. N., in a letter to the Secretary, dated August 12th, communicated the following *Directions for cultivating and cooking the Brinjall,* a variety of the common Egg plant (Solanum melongena), producing dark-coloured elongated fruit, which is much used in the East Indies, especially at Bombay. It is also established as an esculent in the French gardens, under the name of Aubergine. Captain Rainier grows the plants in a frame three feet deep, placed upon a dung bed with twelve inches thickness of compost, the lower eight inches of which should be two-thirds rotten dung, and one-third equal parts of road drift and sifted loam; the upper four inches should be a light vegetable mould. The seeds are sown in February, ten inches apart. The lights are taken off, when the leaves touch the glass. They then require only to be well watered, to bring them to perfection. Each plant yields from six to ten fruits. They are very subject to the attacks of the red spider, but steaming the pit in the usual way will always destroy these insects. Captain Rainier states that the Brinjalls are very generally used in the East Indies in curries and made dishes,

but that the usual and best mode of dressing them, is first to parboil them, and then dividing them lengthways, to score them across and across with a knife, to dress them with butter, pepper, and salt, and then to broil them on a gridiron.

Captain Rainier, in a subsequent letter to the Secretary, dated the 31st of the same month, gave an account of the success which had attended his use of the *Medlar, as a stock for Pears.* The shoots produced from the grafts are very vigorous, extending upwards of three feet in length, but notwithstanding this, they invariably produce great crops as dwarf standards, and fruit the second year after being worked.

Mr. John Bowers, Gardener to the Lord Selsey, at West Dean House, in Sussex, communicated to the Meeting, on the 17th of September, the following *directions for destroying the Bug and Scale on Pine-apple plants.* He prepares a wash consisting of three gallons of rain water, two pounds of soft soap, eight ounces of black sulphur (sulphur vivum), and two ounces of camphor, boiled together for an hour, and to which is then added, three ounces of turpentine. He turns out his plants, divests the roots of their fibres, and immerses them in a trough nearly filled with the liquid at a temperature of from 120 to 136 degrees, for about five minutes. Queen and Sugar-loaf Pines he finds require the highest heat stated; Antiguas and others need not have it above 124 degrees; but those to which a lower temperature is used must remain double the time immersed. When taken out of the liquor they are well drained and set on the flue of the house with the roots downwards, until they become dry; they are then

put into small sized pots, and plunged in fresh tan, with a good bottom heat kept up by dung linings. They are shaded from the sun in the heat of the day, and a little air given until they begin to grow, which will be in about three weeks from the time they are potted. The above operation may be performed any time between the months of February and September.

Mr. John Breese, Gardener to Sir Thomas Neave, Bart. at Dagnam Park, Essex, communicated to the Meeting, on the 17th of September, an account of his *method of growing Pines with a bottom heat of dung*, in a house in which Vines for early Grapes were also to be forced. The house in which he made his experiment is forty-four feet long by seventeen feet wide, and the pit within it is thirty-six feet long by nine feet wide. He placed strong bars across the pit, and on them rested six rows of moveable shelves length-ways, so as to hold six rows of Pine plants, twenty in each row, the bottoms of the pots being about six inches below the curb. From these shelves to the bottom of the pit is about three feet, two feet and a half of which depth was filled up with rank dung from the stable, and the other six inches with old exhausted dung from the linings of Cucumber beds. The Pine plants were then placed on the shelves, and the steam from the fresh dung rising through the exhausted dung on the top, entered the house sufficiently sweet for all the purposes of vegetation, not only of the Pines but also for the Vines, which are trained to the rafters. When the heat declined much, it was renewed by turning the dung once a month and adding a little fresh, and when this failed to give

the temperature desired, slates were put from shelf to shelf, so as to cover the whole space, and the intervals between the pots were filled with tan. This last operation will not be necessary, unless the heat has declined very much, and then care must be taken that the tan does not get so warm as to burn the roots of the plants. Leaves may be substituted for tan, if more convenient. Mr. BREESE has obtained in the house treated as described, both Pines and Grapes superior to what he has seen grown by fire heat. He thinks some plan might be devised to avoid the trouble of moving the plants every time the dung requires turning.

Mr. WILLIAM ROSS sent to the Meeting, from his Nursery at Stoke Newington, on the 15th of October, bunches of the *Black Damascus Grape, the blossoms of which had been fertilized by the pollen of the Royal Muscadine,* and on the 5th of November Mr. ROSS communicated the particulars of the process. He observes that the blossoms of the Black Damascus Grape are known to set very imperfectly, even in the stove, and of course more imperfectly in the vinery or open air. He had a plant of this variety on the open wall, which, for many years, invariably failed to set its fruit, producing only three or four very large berries on a bunch, whilst the remaining blossoms proved abortive. With the view to remedy this defect, he caused, when the Vine was pruned, several shoots of it to be trained in amongst shoots of a Royal Muscadine growing near it on the same wall, so that the blossoms of the two plants should come in contact with each other. This had the desired effect; those bunches which were mixed with the Muscadine all set well, while the rest of

the Vine continued to produce defective bunches as before. Mr. Ross further observes, he has been in the habit of fertilizing with considerable success the clusters of the Black Damascus Grape in a forcing house, by suspending over the blossoms, when fully open, bunches of the flowers of those sorts whose pollen is produced in perfection, which may have been necessarily taken off the Vines in the house: the bunches thus suspended should be occasionally shaken, to cause a dispersion of the pollen.

John Williams, Esq. of Pitmaston, near Worcester, communicated in a letter to the Secretary, on the 4th of November, the particulars of *a mode of cultivating Strawberries*, which he has pursued with success. He raises small ridges of earth (running north and south) about nine inches above the level of the ground, and plants the Strawberries on the top, laying flat tiles on each side of the ridge. He finds the produce earlier, more abundant, and better flavoured than on plants grown on the flat ground. In shallow soils this method has the advantage of giving increased depth of mould for the roots, and the flat tiles placed on the sides of the ridge not only receive and reflect the rays of the eastern and western sun, but preserve the moisture under them, so that in very dry weather it will be found that the ridges require less water than the common beds. Mr. Williams observes, that this mode of planting would be too expensive for market gardeners, but in private gardens it is worth attention, as, in addition to the other advantages above recited, it keeps the fruit free from dirt after heavy showers of rain.

John Rigden Neame, Esq. communicated to the Meeting, on the 17th of December, *a plan for preventing the drip in glass houses,* which falls from the sash bars on the plants below them, and consequently injures them. Mr. Neame attaches small thin copper gutters to the bars of his lights in the manner represented in the annexed sketch.

They are fastened on with pins the whole length of the bar, and conduct the water which they receive to the top of the plate which supports the bottom of the rafters, from which it falls into a gutter which runs along the front of the house on the outside.

IX. *An Account of* a New Seedling Grape. *In a Letter to the Secretary. By Mr.* Henry Burn, *F. H. S. Gardener to the Marquess of* Ailesbury, *F. H. S. &c.*

Read December 7, 1824.

Sir,

I have the honour to send you herewith another specimen of the *New Muscat Grape,* for exhibition to-morrow, at the Meeting of the Society. I regret that I was not able to send you any bunches of it in September, as I had intended, but those which you received in July will have enabled you to judge of the size to which they attain; and what you now receive will furnish a better sample as to flavour, those first sent having been scarcely ripe. The Society having deemed so highly of the Grape as to honour me with a Silver Medal for having raised it, I have thought it right to send you such particulars relative to the Vine, as may serve to record its origin.

In the spring of the year 1819, I sowed a considerable number of seeds of the Muscat of Alexandria Grape in a pot, in the Pine stove. When the plants came up, I remarked one much stronger than the others, and which soon took the lead of them all so decidedly, that I planted it by itself, and rejected all the rest. In the following spring, I turned it out against the back wall of a Pine stove (having no more favourable situation for it), and trained the shoots down the rafters to the front. The plant grew with great vigour, but was not allowed to bear till 1823, and then only a few bunches were suffered to ripen on it. This year it has borne a full crop, or, I ought rather to say, three crops, for the whole of the

first bunches were cut in July, while its second crop was yet young. The second was cut in the end of August and September, and those now sent, which had not shewn themselves in July, are a part of the third. This will serve to satisfy you that the plant is a remarkably free bearer, and its produce, in point of size, both of bunch and berry, is not inferior to that of the Old Muscat. By all who have tasted the fruit it has been allowed to surpass that variety in flavour.

I am, Sir,

your very obedient Servant,

HENRY BURN.

Tottenham Park, near Marlborough,
December 6, 1824.

Note by the Secretary.

Fruit of the Vine described above, was exhibited at the Meeting of the Society on the 6th of July, and again on the 7th of December, 1824. The bunches first shewn were of good size, the berries resembling those of the Old Muscat of Alexandria, but they were larger, and of superior flavour. It is proposed to call it the *Tottenham Park Muscat Grape,* in order to record its origin.

X. *An Account of a* Lime Duster *for the Destruction of Insects on Fruit Trees. In a Letter to the Secretary. By Mr.* Samuel Curtis.

Read April 20, 1824.

Sir,

I am anxious to lay before the Horticultural Society a plan which I have adopted for *preventing the depredations of insects on Fruit-trees,* hoping it may prove as beneficial to others as it has to me.

For many years past, my orchard at this place, containing many thousand Fruit-trees, and occupying fifty acres, has been so completely divested of most of its foliage and young fruit, in the spring months, that at midsummer little more than the bare twigs were left, and I had serious apprehensions that my plan of planting so largely, adopted sixteen years ago, would prove a failure, unless some remedy could be found for so serious an evil. With this view, I had for several years been careful to wash, with lime and water, the stems and branches of my trees, but this I found ineffectual for the destruction of those insects which prey on the young buds and leaves. I therefore had a Cannister made of tin, similar to that sent herewith, and of which a figure is annexed.

Quick lime pulverized, and often sifted through a fine sieve, was put into the cannister, and I had it shook over the young foliage just as it was expanding. The first season I used it, the fresh hatched caterpillars had commenced their depredations, but so easy was the application of the Lime Dust with this machine, that I soon effected the destruction

of almost the whole of them; for although they sheltered themselves as long as they could, their food was rendered so unpalatable, that they either died, or dropped off in search of other food, so that the spring shoots of my trees were preserved in full vigour, a circumstance which had not occurred for several preceding years. The next season, as soon as the young caterpillars were discovered, I commenced the same operations with the like success, and the foliage was then so fine that I had very few bitten leaves, and the whole of my orchard put on such a perfectly different appearance, that persons who were in the habit of seeing it two or three times in the year, were astonished at the change. The consequence of thus preventing the destruction of the leaves was a most abundant crop of fruit (from 3 to 4000 bushels), and my trees are now in a most promising state for as great a bloom as ever. The time for using the powder is in the dew of the morning, or whenever the leaves are damp, and if there should be a gentle breeze sufficient to carry the dust obliquely through the head of each tree, it is the more quickly performed. Under favourable circumstances of this sort, I found that three men, provided with the powder in a large box on a light wheelbarrow, could dress from two to three thousand trees in a day. When the wind changed I had the trees dusted on the other side. Although used ever so freely, no person need fear any injury from the caustic quality of the lime on the most delicate fresh expanded foliage; it is only prejudicial to insects of all kinds, and to dead vegetable matter.

I use the lime for the trees the first time, when the bunches of blossom buds are separating, but the corollas not expanded; at this period many small caterpillars hatch and

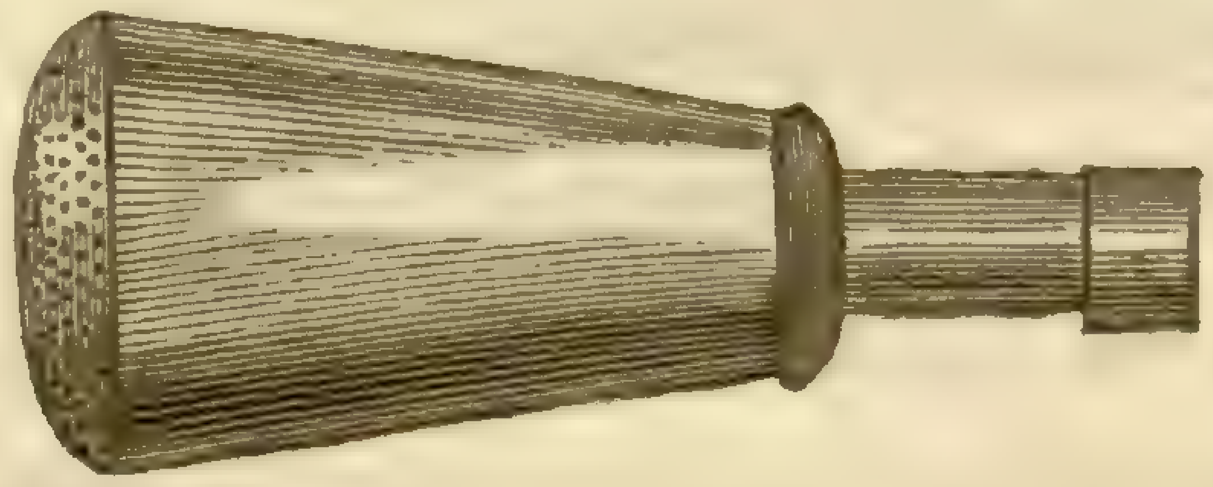
take shelter amongst the footstalks, and eat into the young fruit, and I believe this is the time when the depredation on all the fruit commences, though it does not shew itself until much later periods. The young shoot buds are much later, but the dusting preserves them in their infancy. After the blossom is over and when the foliage is expanding, one or two more dustings may be applied to advantage, and the leaves will be preserved in good health and beauty. If rain happens shortly after the dusting, the condition of the caterpillars is not much better, as the lime water surrounding them is as prejudicial to them as the powder, but those which either escape or are fresh hatched, must have the powder applied again, as soon as possible, or they will prey on the fresh washed foliage.

The cannister which I have used is twelve inches long, seven inches wide at its broadest, and four inches on its narrowest part, and the handle is five inches and a half long, the top of the handle is fitted with a cap, which is put on when the lime is to be thrown on low trees, but when high trees are to be operated upon, the cap is removed, and a pole, of sufficient length to reach the height required, is inserted into the handle. I remain, Sir,

your very obedient Servant,

SAMUEL CURTIS.

Glazenwood, near Coggeshall, Essex,
April 16, 1823.



XI. *On* Forcing Cucumbers. *In a Letter to the Secretary. By Mr.* Thomas Allen.

Read January 4, 1825.

Sir,

I beg leave to offer to your notice the following *method of growing forced Cucumbers,* which I have practised upwards of twenty years with success, always producing abundance of the fruit under frames from March till October. In the last year (1823) I worked seventy lights for the London market, the produce of the whole was 3360, or four dozen Cucumbers to a light, which is, I believe, a greater product than is usually obtained by any of the ordinary methods of treatment.

The most obvious defects in the common management of Cucumbers under lights are, firstly, that the earth or compost is of too light a quality, not containing sufficient strength and depth to support a succession of fruit through the season, particularly if there should be much sun; and secondly, the dung is not always sufficiently worked in the bed before it is earthed over, and it is generally left burning in a confined state, so that when the roots of the plants come in contact with it, instead of finding it congenial to vegetation, it destroys the roots, and consequently injures the health of the plants, subjecting them to the attack of the red spider and other insects.

Having stated these defects, I will now describe the method I have practised, and commence with the dung-bed. If it is to be made in December or January, four feet in

height will be requisite. The hot horse dung of which the bed is composed must have been turned and watered five or six times before it is used. In making up the bed the dung should be well beaten with the back of the fork, about twelve inches round the outsides, but only slightly in the middle of the bed. When the bed is made up, put on the frame and lights, and cover up with litter and mats, applying a slight lining round. As soon as the heat is perceived, raise the lights to let off the rank steam. In about three days after, uncover the whole, take off the lights, and fork up the dung twelve inches deep, breaking the lumps, and picking out any stones that may appear in it; then sprinkle the bed with water, and cover up, raising the lights as before directed. The forking and watering should be repeated three times a week, until the dung becomes sweet, which may be ascertained by closing the lights for an hour, and observing if the globules of water that hang under the glass are white and transparent, and the steam without any unpleasant smell. If this be the case, the bed may be considered in a fit state to ridge, previous to which, take off the frame and lights, fork up the bed twelve inches deep, change the dung from the middle to the outsides, beat the latter solid, and make them about four inches higher than the middle, which should be left concave; then slightly sprinkle the surface of the bed with water, and replace the frames.

The next operation is to prepare a band of straw one inch in diameter, and ten feet long. Rye straw is the best for the purpose, as it will not encourage mice. When the band is twisted to the length required, roll it up in a coil, and it will form a round flat mat, about fifteen inches in diameter, which

should be placed on the dung, under the centre of each light. On the mat, place one bushel of prepared compost, consisting of loam and rotten horse or cow dung, about equal parts, well incorporated together. Put a slight covering on the lights until next morning, when the mould will be sufficiently warmed to receive the plants, or rather plant, for I have found that a single plant brings finer fruit and of more vigorous growth than when two or three plants are put under a light, as is the common practice.

In ridging out, make a hole in the top of the hillock large enough to receive the ball of earth, in which the roots are, entire, leaving the top of the plant, three inches from the glass; the mould should then be dressed up round the hillock and be pressed close to the roots, and within one inch of the seed leaves of the plant, these at no time of earthing should be covered with mould, for that is very apt to cause canker. The earth should be kept within the bounds of the straw mat, and not be suffered to mix with the dung, as that would cause a burning, which is not only troublesome, but in many instances, fatal to the prosperity of the plant, because if the earth is once burnt, its vegetative quality is destroyed, and water will have no effect on it. The only remedy in such case is to remove the mould, fork up and water the dung, lay on a little rye straw, and replace the earth.

After ridging out, the lights may be kept close for an hour or two, according to the temperature of the bed and the weather, then give air from a quarter to one inch in the day, and the former quantity by night, this will promote the health and prevent an elongation of the joints of the plants. The covering must be very slight for the

first three weeks or month; at the most, a single mat put lengthways will suffice, the ends not to hang over the sides.

The heat must be kept up by augmenting the linings once a week, turning over and watering them, when they heat so as to become dry. The bed inside the frame will require forking up about nine inches deep, three times a week, the hillocks at the same time should be examined, and a round pointed stick of about an inch diameter, and eighteen inches long, must be thrust about twelve inches, into the dung, under the straw mat, making five or six perforations under each hillock. Into each of the holes so formed pour from the spout of a water pot, as much water as the state of the bed seems to require, this may be ascertained from the facility with which the perforator goes into the bed; if the bed is husky or burning, the stick will go in with difficulty, and then a large pot of water is required to a hillock; on the contrary, if the bed is in a free state of working, the perforator will go into it very easily, and then a sprinkling from the rose of the pot will be sufficient. The repeated forking of the bed will cause the dung to hover, and get above the straw bands, in which case it is proper to take out at the different forkings the amount of a barrow full to each light; this gives scope for a greater depth of earth, and prevents burning under the hillocks.

The dung, from the continued forking and watering, will become in a fine state to receive the roots of the plants; these, after passing through the proper depth of compost placed over the dung (which is about eighteen inches) will readily strike into the dung, and bear a productive crop of Cucumbers throughout the summer, without their leaves flagging or

requiring any shade. For ascertaining the proper period to make additions to the earth, the best criterion is the appearance of the roots through the sides of the hillock; this should be earthed over about three inches, each time, forking out the dung two inches below the mat, to give a greater depth of earth, each time of performing the operation. The last time this is done, the depth of mould at the back of the frame should be twenty inches. It will be necessary to raise the frame and lights as the plants advance in growth.

When the bed is earthed entirely over, the covering must be augmented, and the mat laid on crossways of the lights; air should not be then admitted at night, and in the day, only when the sun shines; water should also be given plentifully about three times a week, according to the weather and heat of the bed, care being taken not to wet the leaves, or fruit; apply the water from the spout of the pot, without the rose, pouring it against the back of the frame, for the mould will dry faster against the back than the front, in consequence of the heat being there greater and the air being admitted there.

The operation of pruning the Cucumbers is best effected by the thumb and finger, applying the knife only to cut away decayed leaves, the runners should not be cut or thinned out, the tops only should be pinched off, and at every joint, beginning when the plant has two rough leaves, and the second rough leaf is about an inch in diameter. That will cause the plant to produce a fruit and fresh runner in succession at every joint, it will likewise add to the strength of the plants. The tendrils as they appear should be taken off, likewise the male blossoms, which are not wanted for impregnation, which operation in an early season

it is requisite should be performed artificially. When the fruit is set, place a piece of glass under it, which will keep it clean, of good colour, and preserve its bloom.

The sort of Cucumber I have found to force best, and to be most productive, is the Southgate. I prefer seed three or four years old, to new seed, the latter being apt to bring plants which are luxuriant, and do not come into bearing so soon.

I am, with the highest respect,

your most obedient,

humble servant,

THOMAS ALLEN.

3, Marylebone Street, Golden Square,
December 27, 1824.

XII. *Description of the different Varieties of* Endives *cultivated in the Garden of the Horticultural Society of London,* in the Year 1824. *By Mr.* Andrew Mathews.

Read December 21, 1824.

The *Cichorium Endivia* of Botanists, a plant said to be a native of the Northern provinces of China, and of other parts of Asia, is the parent of all the *Endives* now cultivated in Europe. It appears to have been introduced into use as an esculent at a very early period, for it is noticed as such by Caspar Bauhin and other writers on plants in the beginning of the seventeenth century, and even earlier. Communication, during the last few years, with the gardeners of the other parts of Europe, has brought us acquainted with several kinds of peculiar excellence, which are novelties in England, but which, from their superior qualities, deserve cultivation. As these have all been grown in the two last seasons, in the Garden of the Horticultural Society, I have availed myself of the opportunity afforded by my situation, as Clerk in the Society's Garden, to prepare the following account of them. I have arranged the different varieties under the two principal heads of *Batavian* and *Curled-leaved,* considering them as forms of one of these two principal divisions.

Batavian Endives.

Under the Batavian Endives are included all the varieties with broad leaves, generally rounded at the points, with the

margin slightly ragged or torn, not curled. These are called by the French *Scaroles.*

1. Broad-leaved Batavian Endive.

Synonyms.

Broad-Leaved Endive, of the Dutch.
Double Yellow Endive, of the Dutch.
Common Yellow Endive, of the Dutch.

The leaves are large, long, and broad, the edges somewhat ragged, the outer ones grow particularly upright; the plants form but little heart of themselves, but the length of the outer leaves is such, that they tie up well for blanching. This sort has not so good an appearance when ready for use as the curled sorts, and is more bitter than some of the other kinds. It is much given to sport, some plants producing leaves more cut than others.

2. Curled Batavian Endive.

Fine Curled Endive, of the Dutch.
Curled Yellow Endive, of the Dutch.

The leaves are neither so large nor so broad as those of the Broad-leaved Batavian Endive; they grow flat on the ground, and are curled at their edges. The whole appearance of the plant is very different from the preceding, approaching the Curled Endives in general character. The heart, which forms of itself, is small, and lies close to the ground.

3. Small Batavian Endive.

Scarole petite.
Scarole courte.
Scarole ronde.

The seeds of this and the other French kinds were received from M. Vilmorin, of Paris. Its leaves are whitish green, broad, of a moderate length, and slightly ragged at the edges; the inner ones are numerous, and turned over like a hood (cucullate) at the end, forming a larger head than any of the other kinds. This is certainly the best of the Endives, and a valuable addition to our winter salads; it blanches with little trouble, and is mild and sweet, without being bitter.

4. Large Batavian Endive.

Scarole grande.
Scarole de Hollande.

This differs from the preceding only in the size and shape of its leaves, which are broader and more rounded; they are a little darker, but yet pale; the inner ones are turned over like the preceding, though not so regularly, but form a large and well blanched heart of good flavour. Both these will blanch perfectly, if a mat is laid over them, and they do not require to be tied up. They appear hardier than the Curled Endives.

5. Lettuce-leaved Batavian Endive.

Scarole à feuille de Laitue.
Scarole Blonde.
White Batavian Endive.
New Batavian Endive.

The leaves are large, broad, and obtuse, very slightly

ragged at the edges, of a paler colour, and thinner texture than either of the other Scaroles; the inner leaves are less numerous, and do not turn in so much. To blanch it, the leaves must be tied up, and it must be cultivated for an early kind, because it is tender and incapable of standing severe weather.

The three last Endives are new to the English gardens, for amongst the sorts from seeds supplied to the Society, previously to the last year, nothing like them occurred; but amongst those received from English seedsmen in the season of 1824, two packets came under the names of *White Batavian* and *New Batavian,* which proved to be the same as the *Scarole à feuille de Laitue* of the French.

Curled Endives.

By Curled Endives are meant those with narrow leaves, more or less divided, and much curled; they are usually very full in the heart. The French call these, by way of distinction, *Chicorées.*

6. French Small Green Curled Endive.

Chicorée frisée fine d'Italie.
Chicorée d'été.
Fine Curled Endive.

The leaves are much cut, the outer ones are not more than three or four inches long, and grow close to the ground; the inner ones are short, numerous, and curled, and form a close full heart. This is much the smallest of any of the kinds, and is somewhat tender. The inner leaves are apt to rot in wet weather. The outer leaves are so short, that they will not tie up, but blanch well by being covered simply with

a flat garden pan. This is a recent introduction from France, the English Synonym quoted to it came only this year, and from one seedsman's collection.

7. Small Green Curled Endive

Green Curled Endive.
Chicorée Frisée.
Chicorée de Meaux.
Chicorée Endive.

Leaves much cut and curled, from six to seven inches long, lying flat on the ground; heart leaves full and close; this is of a darker green than the preceding, and will tie up much better for blanching. It is an early kind, and is liable to rot in the heart from too much wet.

8. Large Green Curled Endive.

Green Curled Endive.
Cut Yellow Winter Endive, of the Germans.

Differs from the Small Green Curled Endive, for the outer leaves are generally ten to twelve inches long, growing looser and rather more upright; the inner ones are less numerous, and not quite so much divided. It ties up well to blanch, is hardy, and does not rot. The English gardeners do not appear to have distinguished the Small and the Large Green Curled Endives from each other, for the name of Green Curled alone was given to seeds from which both

varieties were raised. The last was received from M. Seidel of Dresden, and none similar occurred in the French collection.*

9. Italian Green Curled Endive.

Indivia Riccia.

The leaves are narrow, ten to eleven inches long, divided to the very midrib, they grow rather upright, the segments are much cut and curled; the whole of the plant is a dark green. Seeds of this sort were received from Italy in 1823, from two different persons, under the same name. It is very distinct from any in the Collection, being strongly characterized by its long stalked leaves, and by the distinctly pinnatified manner in which they are cut. It is an useful sort, and ties up well.

10. Dutch Green Curled Endive.

Large Green Curled, of the Dutch.

This approaches the Large Green Curled Endive in appearance and growth, but the segments of the leaves are deeper, the outer leaves are broader, not so much curled, and the inner ones more turned into the heart. The outer leaves are about ten inches long. It blanches well, and is hardy. The seeds of this kind were received from Messrs. Schertzer of Haarlem, with the name quoted.

* The *Chicorée grosse à cuire* was not among the varieties sent to the Society by M. Vilmorin; it is the only kind cultivated in France, which I have not had an opportunity of examining. I think it probable that it is referable to the *Large Green Curled Endive.* The account of it which has been lately received from M. Vilmorin is, that it is a subvariety of the *Chicorée de Meaux*, (Small Green Curled Endive), of stronger growth, and forming a larger heart.

11. Long Italian Green Curled Endive.

Indivia Longa.

The leaves are long, very deeply divided, and more upright in their growth than those of the Large Green Curled; the segments of the leaves are large, and cut, but not disposed to curl. The heart leaves are few and short. This kind is very distinct from any either in the French or English collections, and is a desirable variety, though not so neat in appearance as some others. The seeds of this and one of the packets of Indivia Riccia were brought from Italy by Roger Pettiward, Esq. and presented to the Society.

12. White Curled Endive.

White Endive.
Chicorée toujours blanche.
Chicorée blanche.

The leaves are from seven to eight inches long, finely curled, with a very open heart, growing flat on the ground. The whole plant is of a pale yellowish colour. The produce of French seeds of this kind has been uniformly found superior to the plants raised from seed saved in England. The French use it when young for salads, and it appears fitter for that purpose than for a Winter Endive, the leaves when fully grown being tough and more bitter than most of the other kinds.

XIII. *Description of a newly invented Instrument for effectually applying* Tobacco Fumigation *to Plants. By Mr.* John Read, *of Newington Causeway, Southwark.*

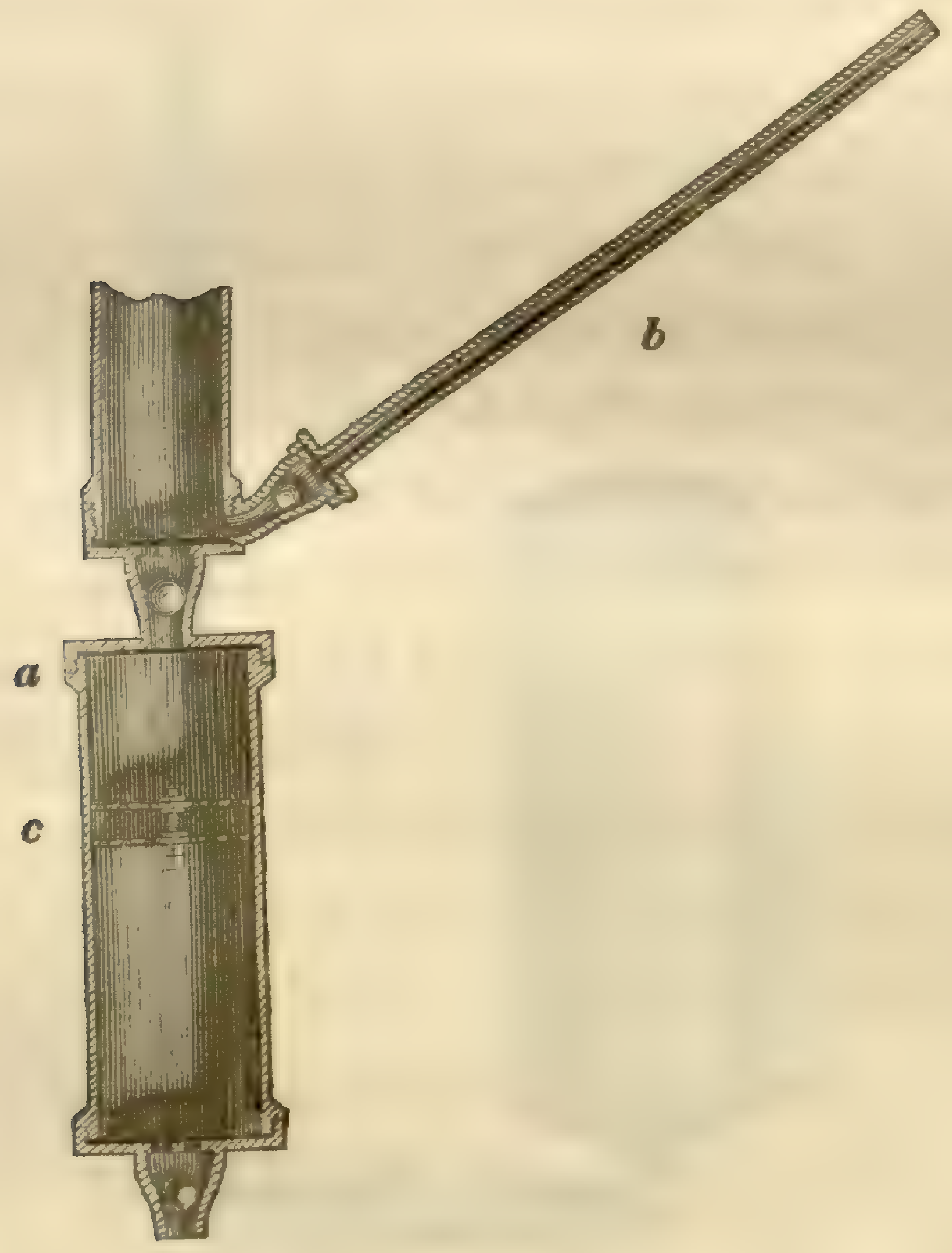
Read July 6, 1824.

THE practical inconvenience, so generally complained of, in the use of the fumigating bellows, led me to the construction of an apparatus of a different form. I have therefore prepared a valved cannister, to be fitted to my Patent Garden Syringe (which is described in the Fourth Volume of the *Horticultural Society's Transactions*, page 488), which I respectfully beg to submit to the inspection of the Society. The fumigation of trees and plants with the bellows has always been inconvenient, and at best imperfect, arising from the following causes:—The current of atmospheric air necessary for the combustion of the tobacco, being driven with much force through the box that contains the herb, the incinerated residuum is forced into the minute perforations, and being rendered glutinous by admixture with the essential oil of the tobacco, effectually choaks them, and prevents any further action of the instrument.

In the apparatus that I have constructed, the above difficulty cannot possibly arise, as the air, after passing very gently through the tobacco cannister (*a*), and loading itself with the fumes, does not return by the same channel, but is forced out through a lateral tube (*b*) in the syringe, leaving the burning materials undisturbed. The more effectually to

keep the tobacco close and compact, I have constructed a plunger (*c*), with two plates, placed at some little distance from each other, and pierced with conical perforations with their bases upwards. This plunger, by its weight, keeps the tobacco from flying about in the cannister in working the instrument, and thus allows the tobacco smoke to ascend through it, without any of its perforations being obstructed, until the whole charge is consumed. I need not point out with what convenience this instrument may be used in forcing houses, pits, and frames, nor the advantages which result from it.

The upper part of the section represents the lower end of the patent syringe to which the cannister is attached.



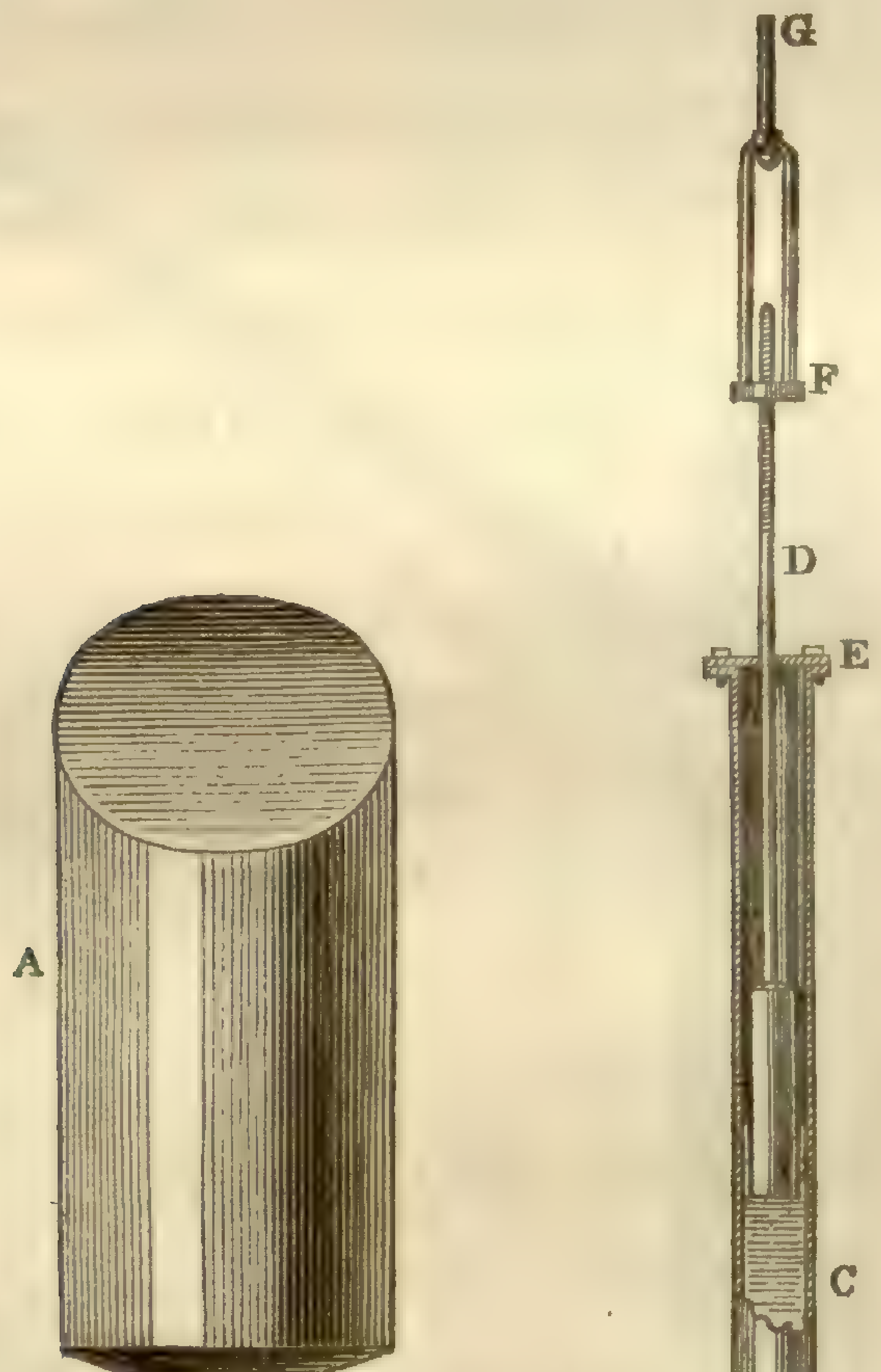
XIV. *Description of a* Self-acting Ventilator *for Hot-houses.* *By* John Williams, *Esq. C. M. H. S.*

Read April 6, 1824.

Dear Sir,

So many accidents happen in forcing houses, from sudden extremes of heat or cold, that I have often thought some simple self-acting valves or registers might be readily contrived for allowing the escape of hot and the influx of cool air during the absence of the gardener.

The following has occurred to me as very simple, and not liable to be out of order.



A, represents the front view of an air-tight vessel made with thin copper, soldered at the joints with hard solder. Its shape may be varied; it may be made cylindrical, or otherwise, so as to present a considerable surface to the sun's rays. B, a tube communicating with the lower part of the vessel, and with the small upright cylinder, C. D, a small rod of brass, or copper, to the bottom of which is affixed a float or buoy, of a size to move freely in the cylinder. E a small flat iron bar, with a hole in the middle, to allow the buoy to rise and fall. F, an adjusting screw, to regulate the opening of the register. G, a rod to give motion to the register, by means of small cranks, rods, or pulleys. No plan of the register is given, because that must be adapted to the particular circumstances of the house, and its mechanism may be left to any ingenious workman who understands hanging house bells.

The vessel A, may contain from two gallons to ten quarts, and must be painted outside with lamp black, mixed with a size or oil, that will not leave a polished surface. When first used the vessel must be heated sufficiently to expand the internal air, water is then to be poured in at the top of the cylinder, so as to give the required motion to the float, and about half an inch of fine oil must be laid on the top of the water to prevent evaporation.

The register may be made to open at 75°, 80°, 100°, or any degree required, by altering the adjusting screw.

The vessel must be placed in front of the upper part of the back wall, and at all times fully exposed to the light. If the apparatus is of proper size, nicely constructed and filled with a proper quantity of water, the registers, one being placed in the upper part of the back wall, for the

escape of the heated air, and the other near the floor of the house for the admission of cold air, will open and close again several times in the course of the day, particularly when the weather is showery, with intervals of bright sun.

Believe me,

dear Sir,

your's truly,

JOHN WILLIAMS.

Pitmaston, 2d April, 1824.

P.S. I beg to observe, that since I transmitted the above, I have seen Mr. MUGLISTON's Paper,* on the same subject, and it is rather remarkable that we should both have adopted the same principle, without communicating with each other; For I had neither seen or heard of his self-ventilating machine till long after I had transmitted this Paper.

* Horticultural Transactions, Vol. v. page 502.

XV. *An Account and Description of the different* Varieties of Strawberries *which have been cultivated and examined in the Garden of the Horticultural Society of London. By Mr.* James Barnet, Under Gardener in the Fruit Department of the Garden.

Read December 7, 1824.

Upon the establishment of the Garden of the Horticultural Society at Chiswick, in the spring of the year 1822, the Secretary transmitted to such of the Fellows and Correspondents of the Society, as were known to be attentive cultivators of *Strawberries,* a printed form, on which was to be noted, the names, characters, history, &c. of the different kinds possessed by each individual, to whom the enquiry was addressed. Upwards of seventy of these forms were filled up, and returned; they furnished, exclusively of a very extensive list of names, a great variety of useful information on the subject of Strawberries, of which I have availed myself in this Paper.

At the proper season, application was made to the persons who had returned these forms, for runners of every kind noticed in them, which, from its name, or any other circumstance, was considered likely to exhibit difference of character; the object being to form, as complete a collection as possible, of all the Strawberries known in the gardens of the United Kingdom.

The parcels of runners thus procured amounted to upwards of four hundred. Small quantities of each were planted, the whole having been arranged, as systematically as the imper-

fect knowledge possessed of many of them would admit of; but still sufficiently for the purposes of examination and comparison, which business was carried on with care, through the seasons of the year 1823 and 1824. My instructions having caused me to pay particular attention to the subject, and having drawn up descriptions of all the kinds which were subjected to examination, I have been directed to prepare the communication, which I have now the honour of submitting to the Society.

The first operation was, the uniting under one head those which appeared to be identical; instances occurred, where one parcel proved distinct from all others, but there were other cases where the union of several became necessary, and the assemblages thus formed have been the authority for the synonymous names, which, it will be observed, are attached to some of the varieties hereinafter described. This having been done, full descriptions both of the fruit and important or conspicuous parts of the plants, were made; and, as was expedient, the most proper established name was attached to each kind, or, where necessary, new names were given.

It will be observed that it is not proposed, in this Paper, to give a full history of British cultivated Strawberries; but that those alone are noticed, which have been not only cultivated, but also satisfactorily examined, in the Garden of the Society. The kinds now brought under observation are those most known and used, but there are doubtless existing in private gardens many, the knowledge of which have not yet reached the Officers of the Society; and there are also several at this time in the Garden at Chiswick, on which sufficient certainty

could not be obtained, to warrant their introduction to public notice at present. Of these, as well as of future novelties, accounts are intended to be hereafter prepared.

I expected to have been able to derive some assistance from the observations on and descriptions of the more established and known kinds, from the writings of modern English Horticulturists, and from the popular manuals of English Gardeners; but I have been altogether disappointed. Their accounts and characters are very vague and imperfect. I propose, however, after I have finished my descriptions, to attempt to refer the different kinds mentioned in those works to the names adopted in this Paper.

The French Writers on Gardening, though little acquainted with our varieties of Strawberries, have been much more correct in describing their own; but as I am not sufficiently informed on all their kinds, I have deemed it more advisable to omit the notice of the French Strawberries altogether, rather than refer to them partially.

I have also avoided, except in the general Classification, using the scientific names given to certain kinds by Botanical Writers. The question of which are species and which are varieties is altogether foreign to my purpose, and the quotation of those Names, on the application of which there are doubts, might give an appearance of deciding on points, which I do not propose to attempt.

In order to facilitate the arrangement of the collection of Strawberries in the Garden of the Horticultural Society, the whole have been disposed into the following seven Classes or Divisions:—

1. *The Scarlet Strawberries.* The type of this division

is the Fragaria Virginiana of Botanists; the F. Canadensis of Pursh is also included; by which, I presume, it was intended to designate the Strawberry known in our gardens as the Duke of Kent's Scarlet. The character of this class is to have the leaves nearly smooth, dark green, of thin texture, and with sharp-pointed serratures; their fruit mostly of small size, and bright colour, with the seeds more or less deeply embedded, with ridged intervals; the flavour acid, with slight perfume.

2d. *The Black Strawberries.* This is not a numerous Class, the Old Black Strawberry being the type, and the remainder are derived from its seeds either impregnated by itself or by others. Their character is to have the leaves rugose, pale green, and small; the fruit middle sized, conical, with a neck, very dark coloured when ripe; the seeds slightly embedded; the flavour very rich, and highly perfumed.

3d. *The Pine Strawberries.* Under this head are arranged the true Old Pine, and others resembling it; the Bath Scarlet and its affinities; the Imperial and the dark varieties similar to it; with the pale-coloured Strawberries often, but erroneously called Chilis. The general character of the Class is to have the leaves almost smooth, dark green, of firm texture, and with obtuse serratures; the fruit large, varying from nearly white to almost purple; the seeds prominent, on a smooth surface; the flavour sweet, and often perfumed.

4th. *The True Chili Strawberry.* Fragaria Chiloensis; which has not, as far as my knowledge extends, yet sported into varieties; though there have recently been raised from it by cross impregnation, some new kinds, which from their bearing greater affinity to it than to their other parents, are

placed in the same division with it. The character of all is to have the leaves very villous, hoary, with small leaflets, of thick texture, with very obtuse serratures; the fruit very large and pale; the seeds prominent; flesh insipid in the type.

5th. *The Hautbois Strawberries.* Fragaria elatior; of which there are more varieties than are generally known, and it is to the want of correct knowledge of the qualities and properties of these, that the erroneous opinion has originated of the Hautbois being unproductive. Their character is to have tall, pale green, rugose leaves, of thin texture; the scapes tall and strong; the fruit middle sized, pale, greenish white, tinged with dull purple; the seeds slightly embedded; the flavour musky.

6th. *The Green Strawberries.* Fragaria collina of Ehrhart, and Fragaria viridis of Duchesne. The French cultivate several kinds which appear to be varieties of this Strawberry; the only one at present much known with us, is called the Green Pine, or Pine Apple Strawberry, which, generally speaking, is kept in gardens more as an object of curiosity than of use, for it rarely produces perfect fruit, though in some particular situations it bears well. Its merit consists in the high flavour of the berry, which approaches that of the Hautbois. Its habit is dwarf; the leaves pale, light green, and strongly plaited; the fruit small, globular and pale. In general character the plants are akin to the Wood Strawberry.

7th. *The Alpine and Wood Strawberries.* Fragaria semperflorens and Fragaria vesca. The habits and general character of these are very similar, the principal difference being in the shape of the fruits, which are usually conical in the

former and more globose in the latter. There are red and white fruited varieties of each. The Alpines produce fruit in the autumn, which the Wood Strawberries do not. We have of late received from France several varieties. It is to these kinds that the attention of the French Gardeners is almost exclusively directed.

The following detailed notices do not include any of the kinds belonging to the two last divisions. I have not had it in my power to attend to them with the same advantage that I enjoyed with the others: the different plants of these not having all succeeded equally well, the opportunities of comparison were not sufficiently perfect, to enable me to make descriptions of the whole, with such correctness as I could rely on for publication.

The following preliminary observations, as to the descriptions, are necessary.—In mentioning the size of the fruits and flowers it is to be understood that the comparison is only made between those belonging to each particular Class, relatively to which, the berry or blossom of any individual found in it, is described as large or small.—Instances occur in which it is noted that the fruit of the variety under description has a core, the idea intended thereby to be conveyed is, that the core readily separates, adhering to the calyx when the berry is removed. Other Strawberries have such cores, but they remain with the fruit when the calyx is torn away.—The winter state of the leaves is different, in the varieties of each class, where this difference is very remarkable it will be particularly noticed in the proper places; but in general the duration of the foliage is much affected by the quality of the

soil of the garden; in stiff ground the leaves continue more perfect, than in loamy or sandy land.

Particular care has been taken to affix the proper names to the old kinds, it being presumed that the future appellation of each will probably be determined by the authority of the Horticultural Society. The number of synonyms would have been considerably greater had the names received from private gardens been all adopted; single instances of such use cannot be considered worthy of record, and it is only where a name has come from a Nursery Garden, or been used in more than one private collection, that it has been thought proper to treat it as established. Some instances will be found where the Seedlings of individuals are entered as synonyms of older kinds; it must not however be inferred from this circumstance, that in all these cases the persons whose names they bear, did not obtain them from seed; doubtless it was so in many. The fact is that Strawberries frequently reproduce themselves unchanged from seed, and when that happens the new production cannot be treated otherwise than as identical with that from which it sprung; and from this accordance many new-raised individuals are necessarily joined to their parents.

Mr. Robert Gunter, of Berkeley Square, has been so obliging as to furnish some useful information as to the qualities of certain of the kinds when used as preserves, and I have only to lament that every variety was not submitted to his examination, the result of which would have given to this Paper a considerable additional degree of interest and value.

Class I. Scarlet Strawberries.

1. *Old Scarlet Strawberry.* This, which has been an inhabitant of our gardens nearly, if not fully, two hundred years, was doubtless an original introduction from North America. It is singular that a kind of so much excellence, as to be at present scarcely surpassed by any of its Class, should have been the first known. It continued in cultivation considerably more than half of the period of its existence as a garden fruit, without any variety having been produced of it, either by seed or by importation from America.

Synonyms.

Scarlet.	Virginian.
Early Scarlet.	Scarlet Virginian.
Original Scarlet.	

A good bearer and ripens early. The fruit is globular and middle sized, when ripe of an uniform light scarlet, and slightly hairy; the seeds are deeply imbedded, and the intervals between them are ridged; the flesh is pale scarlet, firm, and high flavoured. The calyx is small and spreading. The leaves are rather abundant and dense, growing on slightly hairy footstalks; the leaflets are large, oblong, somewhat folded together, coarsely and sharply serrated, their upper surface smooth, the young ones pale or yellowish green, becoming afterwards darker, and then they are liable to be marked with brown stains or spots. The runners are numerous, brownish where exposed. The scapes are short, generally half the length of the leaf-stalk; the peduncles of moderate length; the flowers abundant, middle sized, opening early. The

leaves perish before the winter in this and most others of the Scarlet Class; in the few cases where they are retained, the peculiarity will be noticed.

This Strawberry has long continued to hold its station in public estimation; it is deservedly a favourite, being considered by many the best and most useful variety, and it will probably not be put aside by any of the new productions. It has peculiar merit with the confectioners from imparting to cream, either for ice or other purposes, its flavour, which possessing much acidity, sugar brings it out. It is equally good for water ices, and makes excellent preserves, though its colour in a jam is inferior to that of some others.

In some of the gardens round London a *Large Scaretl Strawberry* is said to be cultivated, but I do not find that it differs, when grown under similar circumstances, from the Old Scarlet.

2. *Oblong Scarlet Strawberry.* Is a new variety in the gardens, and hitherto but little in cultivation. A single plant was observed about ten years since by Mr. Thomas Gibbs, growing in a bed of Old Scarlets in his nursery at Old Brompton; he propagated it, and as soon as possible, sent it to some of his friends and customers under the above name. It was presented to the Society not only by Mr. Gibbs, but also by John Aiton, Esq., from the Royal Gardens at Windsor and by Captain Peter Rainier of Southampton; it was also received from the late Mr. James Lee of Hammersmith under the name of Padley's Early Scarlet, and by him supposed to be a seedling raised by William Padley, Esq. of the Royal Gardens at Hampton Court, but it having been ascertained by

enquiry from Mr. Padley, that he has no knowledge of the Strawberry, it may safely be concluded that this name is one of the many instances of erroneous nomenclature which occur in all classes of fruits, and in none more than in Strawberries.

Synonyms.

Long Scarlet. Long fruited Scarlet.
Padley's Early Scarlet.

An abundant bearer, ripening early, almost as soon as the Old Scarlet. The fruit is oblong, rather large, with a long neck, which part being without seeds has a peculiar glossy or shining appearance; this is however also observable on the remainder of the fruit; the colour when ripe is a bright light scarlet; the seeds are few, and deeply embedded, between ridged intervals; the flesh is of nearly the same colour as the outside, but a little paler, firm and well flavoured. The calyx is small and reflexed. The leaves are numerous and dense, with tall, slightly hairy footstalks; the leaflets are small, elliptical, and pointed at both ends, concave, spreading or reclined, with uniform sharp serratures, their upper surface nearly smooth and shining dark green. The runners are similar to those of the Old Scarlet. The scapes are scarcely the length of the foot-stalk; the peduncles short, and very weak; the flowers small and early.

This is a good Strawberry, and deserving of cultivation in all large collections, as yielding a berry of different appearance for the table, at the same period with the Old Scarlet, which it resembles very much in habit, though its leaflets are smaller and serratures much finer. The fruit is very good as a preserve.

3. *Charlotte Strawberry.* Was raised from seed a few years since by Mr. Michael Keens of Isleworth. A short account of specimens exhibited to the Horticultural Society in 1821 is published in the Transactions,* but I suspect the account of its origin, which is there represented to have been the Pine, is not very correct.

Synonym.

Princess Charlotte's Strawberry.

It is a very moderate bearer, but ripens early. The fruit is round, middle sized, hairy, when ripe dark purplish red; the flesh scarlet, firm, and very high flavoured. The calyx is small and spreading. The leaves are dense, with tall, slightly hairy footstalks; the leaflets are oblong, somewhat folded together, spreading or reclined, of thick texture, with bluntly pointed serratures; the upper surface almost smooth, and a shining dark green. The runners are slightly hairy, light brown where exposed. The scapes are nearly half the length of the leaf-stalk, hairy, with long peduncles; the flowers are numerous, early, larger than those of the Old Scarlet.

In habit this variety is dwarfer than the Old Scarlet, its leaflets are considerably darker and the fruit is higher flavoured, it is perhaps the richest of all the Scarlets, which circumstance joined to its dark colour, recommended it to notice on its first introduction, and great expectations were raised of it, but having proved unproductive, it will never be generally cultivated. Its colour, which when fresh is very brilliant, becomes soon dull, and after having been separated a single hour

* See Horticultural Transactions, Volume v. page 260.

from the plant, the berry appears as if it had been gathered too long.

4. ***Roseberry Strawberry.*** Was raised about the year 1808 in the garden of ROBERT DAVIDSON, Esq. at Aberdeen, who gave plants of it to Messrs. CADENHEAD, nurserymen in that place. It was sent to London from Aberdeen in the spring of 1815. In the following year the fruit it produced excited considerable attention. A history, description, and figure of it were published in the Transactions* of the Horticultural Society in 1817; it was there stated that Messrs. CADENHEAD were the original growers of the Strawberry, but this error was subsequently† corrected. It was named the Rose Strawberry, because the original plant grew under a Rose bush.

Synonyms.

Rose Strawberry.
Scotch Scarlet.
Aberdeen.
Aberdeen Seedling.
Prolific Pine.

It was received as the Prolific Pine from the garden of the late Mr. JAMES LEE of Hammersmith, where it was supposed to be a seedling from the Old Pine.

It is a most abundant bearer, coming in a week after the Old Scarlet, and continuing to produce blossoms and fruit plentifully in succession for several weeks, and sparingly until late in the season. The plants which have been forced in the spring, if turned out into a shaded and sheltered border, yield a good crop in the autumn; this other Strawberries will also do,

* See Horticultural Transactions, Vol. ii. 1 & 2d Edit. p. 380. 3rd Edit. p. 378.

† See Horticultural Transactions, Vol. v. page 260.

but not so abundantly as the Roseberry. The fruit is large, conical, and pointed, with a very short neck, dark red, hairy; the early fruits assume a cockscomb shape where the plants are luxuriant; the seeds are yellow, deeply imbedded, between ridged intervals; the flesh is firm, pale scarlet, with a core; the flavour is but moderate, it is however agreeable, and best when the fruit is full ripe; it is much admired by many, and even thought by some superior to the Old Scarlet. The calyx is large and spreading. The leaves are very small, growing on short, somewhat erect, hairy footstalks; the leaflets are oval, and pointed at both ends, flat, spreading or reclined, deeply and finely serrated, the upper surface hairy, glaucous green. The runners are very numerous, small, reddish where exposed. The scapes are very short in the early part of the season (those produced later are longer) stiff, hairy, with long ramified weak spreading peduncles; the flowers numerous, large, opening early and continuing late; in dry weather the petals are slightly tinged with pink. The old leaves remain tolerably perfect, during the winter.

This Strawberry is well distinguished from others by its dwarf habit and glaucous leaves. Since its introduction, and especially after it was described and figured, it has rapidly spread into general use. The fruit, by reason of the shortness of the scapes, is formed near the ground and is consequently subject to rot. As a forcer it has merit, because it sets readily and ripens soon, but its great productiveness is probably the chief cause of its popularity. It preserves tolerably, but the flesh is perhaps too firm for that purpose, and it does not want flavour when mixed with iced cream. The fruit is better, and produced in greater quantities, in young plantations than in old ones. Of its pro-

ductiveness ALEXANDER SETON, Esq. gives the following instance, "I got from five insulated plants this season (1822) at one gathering, 450 good Strawberries, and upwards of 450 more at the subsequent gatherings."

5. *Carmine Scarlet Strawberry.* A seedling raised by JOHN WILLIAMS, Esq. of Pitmaston, from a seed of the Roseberry impregnated by the pollen of the Old Black. It first produced fruit in 1820.

Synonym.

Carmine Roseberry.

This is a good bearer, ripening late, and, like the Roseberry, producing its fruit in succession. The fruit is large, bluntly conical, with a neck, a brilliant red, shining as if varnished; the seeds are slightly embedded, with sharp ridged intervals; the flesh is pale scarlet, tinted with red, firm, and very high flavoured. The calyx is large and spreading. The leaves grow near the ground, are numerous, and middle sized; the footstalks slightly hairy; the leaflets of moderate size, obtusely ovate, or elliptical, deeply and irregularly serrated, the upper surface hairy, light green. The runners are small, numerous, reddish on the upper side. The scapes are very short; peduncles proliferous, long; the flowers are very large, and open late.

This Strawberry may be distinguished from the Roseberry by its leaves and flowers being considerably larger, the first are also of a much brighter green. It is a kind deserving of cultivation both on account of its flavour, and its beauty; it

is tolerably productive, and comes into bearing later than some of the others.

6. *Grove End Scarlet Strawberry.* A seedling raised by William Atkinson, Esq. in his garden at Grove End, Marylebone, in the year 1820. Some of the first produce was exhibited to the Society on the 18th of June 1822, and an account of it was subsequently published.*

Synonym.

Atkinson's Scarlet.

An abundant bearer, ripening its berries in succession, and also early. The fruit is of considerable size, depressed-spherical, of a uniform bright light vermilion colour; the seeds are slightly embedded, between flat intervals; the flesh is pale scarlet, firm, with a core; the flavour is agreeable, and slightly acid. The calyx is large, spreading, and somewhat reflexed. The footstalks of the leaves are very tall, weak, and almost smooth; the leaflets are very small, oblong, slightly folded together, spreading or reclined, very deeply, coarsely and sharply serrated, the upper surface slightly hairy, shining light green. The runners are weak, numerous, reddish on the upper side. The scape is half the length of the footstalks, which grow from eight to twelve inches high; the peduncles are long and slender; the blossoms large and early, continuing late.

A first rate Strawberry. In habit like the Roseberry, but the leaves are more elevated, and they do not shade the fruit much; it is singular on account of the coarseness of the serratures, although the leaves themselves are small and of thin

* See Horticultural Transactions, Vol. v. page 399.

texture. It forces particularly well, bearing abundantly, and so treated acquires an excellent flavour. Mr. Atkinson states, "that from a bed in his garden fourteen feet long and five feet wide, a basket equal to a pottle and a half was picked every day for nearly a month, and a considerable quantity besides was wasted, from not being picked."

7. *Duke of Kent's Scarlet Strawberry.* This was sent in 1802 to the Royal Gardens at Kew from Halifax in Nova Scotia, by Mr. Michael Dalton, who was gardener to the late Duke of Kent at the time he was Governor of Canada, and remained there in his service some time after he gave up the command of the colony. The Strawberry was named after His Royal Highness. There is however another account of its origin in the English gardens, as stated below, which makes its introduction much earlier than that by Mr. Dalton, and which accounts for one of its synonyms. It was sent to the Garden of the Society by Mr. George Lindley, from his nursery at Catton, near Norwich, in 1822; he received it from the Rev. Robert Pointer, of Southoe in Huntingdonshire, to whom it was given, about the year 1798, by the late Samuel Whitbread, Esq. who brought it from Germany, and called it the Austrian Scarlet. It was a favourite Strawberry for forcing in the garden of His Royal Highness the Duke of York at Oatlands, from which circumstance it derives others of its names.

Synonyms.

Globe Scarlet.	Cluster Scarlet.
Prolific Scarlet.	Austrian Scarlet.
Early Prolific Scarlet.	Oatlands Scarlet.
Nova Scotia Scarlet.	Duke of York's Scarlet.

A most abundant bearer, ripening very early. The fruit is nearly globular, of moderate or rather small size, when ripe a rich bright scarlet colour; the seeds are deeply imbedded; the intervals sharply ridged; the flesh is solid, pale scarlet; the flavour peculiar, and though sharp, pleasant. The calyx small, spreading, sometimes reflexed. The leaves are opaque; the footstalks tall, slender, very erect, reddish in summer, afterwards becoming green, almost smooth; the leaflets of moderate size, oblong-ovate, with an uneven surface, coarsely and bluntly serrated, pale green. The runners are produced very early, they are numerous, small, and of a reddish colour. The scapes are very variable in length, erect, numerous, some long, others half the length of the leafstalk, others shorter, hairy, with weak peduncles; flowers very small, opening later than some others, and producing short stamens, with apparently imperfect anthers.

The chief excellence of this Strawberry is that it is the earliest of all the sorts, ripening at least a week before the Old Scarlet, and though the berries are individually small, yet they are plentiful, and being borne clear from the ground, are less damaged by wet than many other kinds. When preserved it is excellent both in colour and flavour.

8. *Sir Joseph Banks's Scarlet Strawberry.* This variety was received from the garden of Lord Bagot, at Blithfield, whose gardener, Mr. Robert Buck, obtained it about ten years ago from the Rev. William Rastall, of Newark in Nottinghamshire; he received it from Sir Robert Heron, of Stubton in Lincolnshire, to whom it was given by the late Sir Joseph Banks, as a *New Scarlet.* Thus its present

name is accounted for. It having been held in little estimation by the few who have cultivated it, it has not been much distributed, and is therefore but little known.

It is a moderate bearer, ripening early. The fruit oblong, with a neck, of moderate size, bright scarlet, the apex blunt; the seeds nearly prominent, with very flat intervals; the flesh bright scarlet, firm, and highly flavoured. The leaves are opaque; the footstalks somewhat erect, short, weak, slightly hairy, reddish early in the summer, becoming green afterwards; the leaflets of moderate size, oval, spreading, very flat or slightly concave, uniformly and bluntly serrated, the upper surface slightly hairy, shining bright green. The runners are similar to those of the Duke of Kent's. The scapes are short and slender; peduncles of moderate length; flowers small, and early.

This Strawberry is very closely allied to the Duke of Kent's, with which it has probably sometimes been confounded; it ripens nearly at the same time, and though not so prolific, yet has a superior flavour; its leaves grow more compactly together, and their surface is more even.

9. *Morrisania Scarlet Strawberry.* This Strawberry was received from North America; it was one of a collection sent from New York to the Horticultural Society by Dr. Hosack, in the end of the year 1821. It is a good bearer, ripening early. The fruit grows in clusters, is round, very small, shining dark red; the seeds are not numerous, nor deeply imbedded; the intervals are rounded and wide; the flesh whitish, soft, without a detached core; the flavour tolerable. The calyx spreading with many acute divisions. The foot-

stalks of the leaves nearly erect, strong, hairy; the leaflets small, oblong or oval, concave, with pointed serratures, the upper surface hairy, light green. The runners small, brown on the upper side. The scape half the length of the foot-stalks, somewhat erect; the peduncles are very short; the flowers small and early, the anthers occasionally abortive.

In comparison with the Duke of Kent's, to which it has some affinity, this Strawberry is not much deserving of cultivation. It must be considered as one of those to be kept where varieties are to be preserved, but as not likely to come into general use.

10. *Lewisham Scarlet Strawberry.* Was received from Mr. Henry Bailey, Gardener to the Earl Spencer, at Althorp in Northamptonshire; he got it from Mr. John Willmott of Lewisham, in whose nursery it was raised several years since, from seed of the Hudson's Bay, and sold under the name of the *Scarlet Cluster.*

It is a good bearer. The fruit is roundish, small sized, with a short neck, of an uniform dark, shining, purplish red, growing in clusters, slightly hairy; the seeds imbedded but not deeply, with flat intervals; the flesh scarlet, firm, and solid; the flavour very moderate. The calyx is small, hairy, and reflexed. The footstalks of the leaves are of moderate length, weak, very hairy; the leaflets small, elliptical, concave or flat, yellowish green, sharply serrated, the upper surface very hairy. The runners are small, numerous, purplish. The scapes short, and very hairy, with long branched peduncles; flowers late and small, with small stamens and abortive anthers.

In habit this Strawberry is like the Hudson's Bay, hereafter described, but its leaflets are smaller and more hairy, their surface not so uneven, their texture thinner, and the fruit much smaller. It has not such particular merits as to make it an object of general cultivation.

11. *Clustered Scarlet Strawberry.* This Strawberry was received from the garden of the Duke of Buckingham at Stowe, under the name of the *Clustered Wood Pine*, but as it cannot be considered either as a Pine or a Wood Strawberry, it seemed necessary to give it a new appellation, which has accordingly been done. It was not received from any other quarter, and its origin in the garden at Stowe cannot be ascertained, it is however conjectured that it was introduced there from Ireland, in the time of the late Marquess of Buckingham.

It is a good bearer, and ripens its produce later than many other Scarlets. The fruit is obtusely conical, or nearly round, of moderate size, very dark purplish red next the sun, the other side paler; the seeds are of the same colour as the fruit, unequally embedded between the intervals, which are sometimes flat, and at other times bluntly ridged; the flesh is scarlet, firm, and well flavoured. Calyx large, spreading, and sometimes slightly reflexed. The leaves are opaque, slightly hairy, with tall footstalks; the leaflets large, very flat, spreading horizontally, elliptical, and pointed at the base, with coarse bluntly pointed serratures, the upper surface hairy, yellowish green. The runners are small, numerous, reddish on the upper side. The scapes are shorter than the leaf-stalks, stiff, upright, slightly hairy, branched; the peduncles slender, of

moderate length; the flowers are particularly small, with short and apparently defective stamens, and they open late.

This variety resembles the next in habit, but is without its sweetness. Although the leaves are hairy, they have an unusual shining appearance. It is not a kind of much excellence. When preserved it has a peculiar flavour.

12. *Grimstone Scarlet Strawberry.* The history of this Strawberry is very obscure; it was received, without a name, from Mr. JOHN MEARNS, gardener to WILLIAM HANBURY, Esq. at Shobden Court, in Herefordshire; his account of it is, that four or five years ago, he received plants of three varieties of Strawberries from the garden of the Earl of OXFORD at Eywood, in Herefordshire, which were said to have been received from Mr. JAMES LEE of Hammersmith, in 1817; their names, however, not having been retained. They were planted by him in distinct patches, in the garden under his charge, and afterwards received but little notice until they were taken up, when it was observed that there were two kinds mixed together in one of the patches, some of which were the Strawberry now under notice. It is scarcely credible that if Mr. LEE had ever possessed this variety, he would have neglected it, because no one was more alive to, or careful in distinguishing and separating valuable novelties which fell under his observation, and there was no Strawberry resembling this in his collection in 1822. It must therefore be supposed that it was an accidental production, but whether first raised in the garden at Eywood, or at Shobden Court, must, probably, ever remain uncertain. The name it now possesses was attached to it by a mistake in entering it, in the list of

kinds in the Society's Garden, when it was first received, and has no other authority for its use ; it has been however, retained, and is now published, with the above history of its origin, because the kind having been much admired in the past season, has been very generally distributed to the Members of the Society with that appellation.

It is an abundant bearer ; its time of ripening is later than that of the Old Scarlet. The fruit is conical, with a neck, middle sized, of a dark scarlet colour ; the seeds are numerous variously but deeply embedded, with irregular intervals, acutely ridged ; the flesh is solid, pale scarlet, of excellent flavour, and possessing a peculiar sweetness. The calyx is large and incurved. The footstalks of the leaves are tall, strong, slightly hairy ; the leaflets large, nearly oval, very concave, spreading horizontally, coarsely serrated, the upper surface hairy, yellowish green. The runners are middle sized, numerous, reddish. The scapes are the length of the leaf-stalks, slightly hairy, with peduncles of moderate length ; the blossoms small, with abortive anthers. It retains its leaves in winter.

A most excellent Strawberry, deserving of general cultivation. Though not so strong in habit, it bears some affinity to the American Scarlet, but its fruit ripens earlier. Its peculiar merit is the sweetness of its fruit, in this quality it surpasses every other kind which has fallen under my observation.

13. *American Scarlet Strawberry.* A variety for the knowledge of which the Society is indebted to private collectors, from several of whom it was received. It came only

from one Nursery Garden, but in that case under an erroneous name. It is said to have been introduced from North America, and to have been known above twenty years.

Synonym.

Black American.

It is a very good bearer, ripening so much after all the other Scarlets, as to secure to its possessors the production of that class of Strawberries in succession to a late period. The fruit is large, conical and pointed, with a neck, of a deep rich shining blood red, rough, with numerous brownish seeds, which are embedded, but not deeply, with sharp intervals; the flesh is dark scarlet, firm, and with a core; the flavour rich and agreeable. The calyx is irregularly reflexed. The leaves stand very high, they are large, oblong and opaque; the footstalks erect, slightly hairy, very strong; the leaflets large, slightly concave, spreading horizontally, oval, their texture rather thick, coarsely and roundly serrated, the upper surface slightly hairy, of a very dark shining green. The runners are rather numerous, large, light green, red where exposed. The scapes are short, slightly hairy, strong and upright, with very long branched peduncles; the blossoms small and late, with imperfect stamens, the anthers being mostly destitute of pollen. Its leaves remain on the plant through the winter.

This is the tallest and most spreading of the Scarlets; though the leaflets are much smaller than those of the Old Scarlet, the footstalks are longer and stronger, consequently it is necessary to give it more room than usually is allowed to Scarlet Strawberries, and the scapes being much shaded by the leaves, an additional neccessity is thereby caused for

space to secure the due admission of light to the fruit. It is a variety of considerable merit, and worthy of general cultivation.

14. *Hudson's Bay Scarlet Strawberry.* This kind has been in our gardens twenty years, and perhaps more. It was cultivated by the late Sir Joseph Banks, at Spring Grove, as the American Scarlet; he imported some new Strawberry plants from the neighbourhood of York River in Hudson's Bay about the year 1816, which proving identical with those he had previously possessed, established the correctness of the name by which it is now most known, and which has been adopted in the Garden of the Society. For the original introduction it is believed that Cultivators are indebted to Messrs. Brown, late Nurserymen at Perth; Mr. Robert Brown, one of the brothers, and partners of that firm, has informed me that they imported it between thirty and forty years ago from Rhode Island in America, and it was called by them the Hudson's Pine Strawberry.

Synonyms.

York River Scarlet.	Late Scarlet.
American Scarlet.	Hudson's Pine.

It came also from private gardens as *Atkinson's Scarlet* and *Hopewood's Scarlet*, but there does not appear to be any good authority for such names.

It is a good bearer, and free grower, but not early. The fruit is large, with a neck, irregularly shaped, approaching to ovate, of a rich dark shining red; seeds unequal in size, deeply embedded, with ridged intervals; the flesh pale scarlet, firm,

hollow, with a core, of moderate flavour, with much acidity. The calyx middle sized, reflexed. The leaves are of moderate size; the footstalks very strong, and hairy; the leaflets concave, bluntly serrated, yellowish green above, with conspicuous nerves. The runners are numerous, brown, hairy. The scapes are half the length of the footstalk, branched; the peduncles short; the flowers late, numerous, very small; the stamens short and inconspicuous, the anthers mostly abortive.

This is rather a coarse Strawberry; it should remain ungathered till it assumes a dark colour and is fully ripe, otherwise the acid which it contains predominates, and spoils the flavour of the fruit. Its appearance is attractive, and some of its berries attain a considerable size.

15. *Nairn's Scarlet Strawberry.* A Seedling raised by Mr. JOHN NAIRN, in the garden of THOMAS FORBES REYNOLDS, Esq. at Hackbridge in Surrey. Specimens were exhibited to the Horticultural Society in June 1822, and a notice of the exhibition was subsequently published.* The original plant was raised in 1819.

It is a good bearer, ripening rather late. The fruit is irregularly ovate, sometimes with a short neck, of moderate size, a deep rich shining red; the seeds are very deeply embedded, with sharp intervals; the flesh is pale scarlet, firm, with a core; the flavour not rich though agreeable, with less acid than the Hudson's Bay. The calyx is reflexed. The leaves are very similar to those of the Hudson's Bay, but they are thinner, and slightly resemble those of the Old Scarlet. The runners strong, numerous, and brown. The scapes are more

* See Horticultural Transactions, Vol. v. page 398.

than half the length of the leafstalk, slightly hairy, stiff; the peduncles short; flowers very small, opening late.

This variety resembles the Hudson's Bay closely, but the footstalks are less hairy, the leaflets considerably larger, of thinner texture, the seeds less numerous, and more deeply embedded; the fruit is of a brighter colour, and more regularly shaped, it is very handsome.

16. *Scone Scarlet Strawberry.* A seedling raised in 1813, in the garden of the Earl of MANSFIELD, at Scone, in Perthshire, by Mr. WILLIAM BEATTIE, the gardener, from what was there called the Hudson's Bay, impregnated by the Scarlet. Some years since there was cultivated in Perthshire a Scarlet Strawberry under the name of Hudson's Bay, different from the one I have described as growing in the Garden of the Society, the one here called the Hudson's Bay being there known as the Hudson's Pine. This last produced small pale globular fruit of inferior quality and has been consequently rejected from most of the Scotch gardens. It is not known in the more southern parts of the kingdom, and is not in the Society's collection. It was from this, that the kind now under notice was probably raised.

The Scone Scarlet is a great bearer, ripening late. The fruit is round, of moderate size, without a neck, of a light shining red on the upper side, paler on the other, hairy; the seeds dark brown, deeply embedded, with round intervals; the flesh firm, pale pink; the flavour sharp, with abundance of acid. The calyx middle sized, reflexed. The leaves are very like those of the Hudson's Bay, but broader, and with a less uneven surface; their footstalks are rather long and

pretty deeply furrowed. The runners are similar to those of the Hudson's Bay. The scapes are very short, stiff and hairy, with short peduncles; the flowers are larger than those of the Hudson's Bay, with perfect anthers.

This contains more acid than any other known Strawberry, and may be interesting to the general cultivator, but will not properly form one of a small collection, if selected with care and judgment.

17. *Garnstone Scarlet Strawberry.* This variety is named from the seat of Samuel Peploe, Esq. in Herefordshire, in whose garden it was raised in 1819, by Mr. Andrew Henderson, the gardener. It was first sent to the Society by Mr. John Mearns, gardener to William Hanbury, Esq. of Shobden Court, in the same county.

It is a moderate bearer, ripening late. The fruit is round, middle sized, hairy, with a short neck, when ripe of a rich glossy scarlet; the seeds are red, deeply embedded, with round intervals; the flesh is scarlet, firm, with a sharp agreeable flavour. The calyx is of a moderate size, spreading, and sometimes slightly incurved. The foot-stalks of the leaves are upright, stiff, slightly hairy, reddish; the leaflets middle sized, almost flat, spreading horizontally, coarsely serrated, light green. The runners are numerous, large, and reddish. The scapes short, very hairy, branched, with short peduncles; the flowers are large, with perfect anthers, and open late.

In habit this kind is like the Hudson's Bay, but the leaflets are shorter, and have a flat surface; in the Hudson's Bay the surface of the leaves is very uneven. It is considered in the Herefordshire gardens as a Strawberry of much merit,

as possessing both excellence in flavour and beauty in appearance.

18. *Bishop's Seedling Scarlet Strawberry.* The plants were presented to the Society by Mr. William Falla, of Gateshead, near Newcastle; it was raised in 1819, by Mr. Thomas Bishop, gardener to Colonel Robert Smyth, of Methven Castle, in Perthshire, from seed of the Hudson's Bay, which, as I have before stated, is known in Scotland as the Hudson's Pine.

This Strawberry is a plentiful bearer, ripening very late. The fruit is of moderate size, round, with a neck, hairy, when ripe light scarlet, the seeds deeply and equally embedded, the intervals ridged; the flesh is solid, firm, pale scarlet, with a moderate flavour. The calyx is reflexed. The leaves are dense; the foot-stalks short, and almost smooth; the leaflets large, short, light green, with deep and very coarse serratures. Runners numerous, weak, and brownish. The scapes remarkably short, very hairy, branched, with short peduncles; flowers small, opening late, with small stamens, and imperfect anthers.

In habit this Strawberry seems intermediate between the Old Scarlet and the Hudson's Bay, but is much dwarfer than the former, and ripens later, the leaflets also are shorter and of thicker texture. The fruit is very superior in a jam, being of good colour and flavour. It is altogether deserving of cultivation.

19. *Methven Scarlet Strawberry.* This was also raised by Mr. Thomas Bishop, from the same seed and in the same

year as the preceding, at Methven Castle; it bore fruit in 1816 at that place. A short notice of specimens exhibited in 1820 was published* by the Horticultural Society; these were sent by the Rev. Thomas Garnier, of Bishopstoke, near Winchester. The variety was at that time grown much in Hampshire, having been introduced there in the year 1819 by Mr. Joseph Miller, who then lived as gardener with Lady Rumbold, near Southampton. It is sometimes improperly called the Mathven Castle Strawberry. It was raised from seed of the true Hudson's Bay. On its first appearance the size and beauty of the fruit attracted general notice, and it was eagerly sought after; but its want of richness and flavour has thrown it out of cultivation, except as an object of curiosity.

Synonyms.

Methven Castle.

Southampton Scarlet.

It is a moderate bearer, ripening in succession, and comes into use late. The fruit is very large, cordate-compressed, inclining to cockscomb in the earliest fruit, the late ones conical, dark scarlet; the seeds pale yellow, not deeply embedded, regularly and closely set, with ridged intervals; the flesh is scarlet, very woolly and tasteless, with a large hollow in the centre. The calyx is large, and reflexed. The leaves are strong; the foot-stalks slightly hairy; the leaflets large, nearly round or ovate, irregularly concave, sometimes convex, their texture thick, the serratures deep, the upper surface shining dark green. The runners are very vigorous, light green. The scapes are hairy, very stiff, short, with very strong, long,

* See Horticultural Transactions, Vol. iv. page 509.

branched peduncles; the flowers are small, blossoming late and producing stamens with imperfect anthers.

This is decidedly a bad Strawberry, though by far the largest of all the Scarlets. In habit it approaches the Hudson's Bay, but has a very coarse appearance. It should be gathered and eaten before it becomes fully ripe, and then only is it tolerable. But I am informed it has much excellence with the confectioners, making a valuable sweatmeat, especially when preserved whole.

20. *Vernon's Scarlet Strawberry.* Was received from Mr. George White, gardener to Benjamin Benyon, Esq. at Houghton Hall, in Shropshire; it was obtained by him from George Brooke, Esq. of Chester, but was, it is believed, raised many years since from seed in the garden of the late Samuel Vernon, Esq. of Dee Bank, near that city. Mr. Brooke received it from Mr. Vernon. Until its history was made out, it had been known in the Garden of the Society as *White's Scarlet,* and has probably been distributed with that name.

A good bearer, and ripens early. The fruit is round, middle sized, dark red, rather hairy, the seeds are slightly embedded, with flat intervals; the flesh is pale vermillion, white in the centre, solid, and well flavoured. The calyx is incurved, on the ripe fruit. The foot-stalks of the leaves are dwarf, slightly hairy; the leaflets small, oval, deeply serrated, shining dark green. The runners numerous, hairy, brown on the upper side. The scapes very short, with long, weak, spreading peduncles; flowers large, opening early.

In habit this Strawberry is much dwarfer than the Old Scarlet; its leaves are not so numerous, but shorter, blunter, and of much thicker texture. It differs from the Charlotte, which it otherwise much resembles, in the serratures being deeper and sharper, the upper surface of the leaves also is not so glaucous, and their general texture is thicker. This variety should have the preference to the Charlotte in a collection, as yielding a better crop of fruit, and it is considered one of the best of all the Scarlets for preserving.

21. *Pitmaston Black Scarlet Strawberry.* Was raised in the garden of John Williams, Esq. of Pitmaston, near Worcester, from a seed of the Old Black, the parent plant having grown near a plantation of Roseberry Strawberries; the seed which produced this was probably impregnated by pollen from the neighbouring bed, for the variety has too much affinity to the Roseberry to justify the supposition that it is an accidental sport of the Old Black. It has consequently been placed in the Scarlet Class, on which account a change has been made in its name. It was originally received as the *Early Pitmaston Black.* It first bore fruit at Pitmaston, in 1818.

It is a productive bearer, but later in ripening than several of the other Scarlets. The fruit is of moderate size, oblong, with a neck, dark purplish red, slightly hairy; the seeds are of the same colour as the fruit on the exposed side, yellow on the other, they are embedded, but not deeply; the intervals are rather flat; the flesh is tinted with scarlet, it has a small core; the pulp is tender, sweet, mixed with a pleasant acid, and has a little of the Roseberry flavour. The calyx is very large and spreading, sometimes reflexed. The foot-stalks of

the leaves are tall, weak, almost smooth; the leaflets small, coarse, and irregularly serrated, shining light green, their margins hairy. The runners are numerous, reddish on the upper side. The scapes very short, slightly hairy, stiff, with long slender peduncles; the flowers are large, and the petals become tinged with pink in dry weather.

In habit this Strawberry is like the Roseberry; the leaves, however, are weaker, smoother, and not so glaucous; the fruit, by reason of the shortness of the scapes, and the weakness of the peduncles, when ripe, lies near the ground. Mr. Williams reports that in light soils the plants continue to bear for three or four years without being renewed from runners; and that the fruit from the old plants is more rich, and is also carried higher from the ground.

22. *Autumn Scarlet Strawberry.* Was raised from seed, by Thomas Andrew Knight, Esq. the President, in his garden at Downton, in 1817. It is the kind noted as *Number* 10, in the Account of several Seedling Strawberries communicated by Mr. Knight, and published* in the Transactions of the Society. It sprang from a seed of that variety of the Scarlet, now known by the name of Knight's Large Scarlet, impregnated by the pollen of the Old Black. Having followed the character of its female parent, it is placed in the class of Scarlets. The appellation given to it denotes the period of its yielding its produce.

It is a good bearer. The fruit is about the size of the Old Scarlet, ovate, with a neck, of an uniform dark shining red; the seeds are yellow, deeply embedded, with ridged intervals;

* See Horticultural Transactions, Vol. iii. page 207.

the flesh solid, firm, pale scarlet; the flavour good. The calyx is large and spreading. The footstalks of the leaves are hairy; the leaflets are small, oblong, coarsely serrated, with their upper surface slightly hairy, shining, light green. The runners are small, numerous, greenish yellow. The scapes are very short, stiff, hairy, branched, with long peduncles; the flowers are large and late.

The chief merit of this sort is its lateness in yielding its fruit, which is ripe when all others, except the Alpines, have ceased to bear, and it is sufficiently productive to make it worthy of cultivation.

23. *Narrow-leaved Scarlet Strawberry.* This is another of the cross-bred productions described as *Number* 14, by THOMAS ANDREW KNIGHT, Esq. in the Paper mentioned in the preceding account, and is there briefly noticed as having been raised from seed of the Strawberry called Knight's Large Scarlet, impregnated by the pollen of the Old Black. It is also cultivated by JOHN WILLIAMS, Esq. of Pitmaston, under the name now given to it.

It is a good bearer, ripening later than most of the class of Scarlets, in which it has been placed, from its affinity to them. The fruit is middle sized, conical, with a neck, hairy, when ripe of an uniform bright scarlet; the seeds projecting, with flat intervals; the flesh firm, solid, pale scarlet, with a tolerably rich flavour. The calyx is large and incurved. The footstalks of the leaves are of moderate length, slender, thinly covered with long hairs; the leaflets very long, narrow, flat, reclined, with large coarse serratures, their upper surface hairy. The runners are numerous, small, and very light green.

The scapes very short, hairy, branched, with short peduncles; the flowers large, and late.

Of the seedlings enumerated in Mr. KNIGHT's communication which has been referred to, four are described in this Paper, viz. the two now just noticed, which were Numbers 10 and 14, Number 3 has been named the Sweet Cone, and Number 7 is the Downton, both of these kinds will be found in their proper places hereafter. Of Numbers 2, 4, 8, 16, 17 and 18, descriptions will be given at a future period. *Number* 13 has perished both in the Garden of the Society and in that at Downton; it proved very tender, and not increasing itself by runners, a defect stated of it originally, the variety is entirely lost.

In several of the nurseries round London some of these varieties are sold under the name of *Knight's Seedling*, but from the examination I have been able to make of the plants so called, I apprehend that they consist of more than one of the above sorts. The runners having possibly become mixed after they were distributed by the Society in 1819, when samples of the whole were received from the President.

24. *Knight's Large Scarlet Strawberry.* This Strawberry was sent to the Society by the President; it has been some time known in many nurseries and private gardens, to which it has been communicated under the designation of the *Female Parent of the Downton;* it is also the original from which the two preceding varieties were obtained. Mr. KNIGHT received it some years ago from Mr. JAMES AUGUSTUS HUNTER, of Birmingham, into whose nursery near that town it had been introduced as the American Scarlet,

but that designation having been already appropriated to another variety before described, renders it necessary to adhere to the one by which it is known not only in the Garden of the Society, but more generally where it is cultivated near the Metropolis. It was raised by Walter William Capper, Esq. who, at the time, resided near Birmingham, from seed procured by him from America, and the plants were given by him to Mr. Hunter.

Synonyms.

Knight's Scarlet.	Hairy leaved Scarlet.
American Scarlet.	Large Scarlet.
Great American Scarlet.	

In more than one instance it has been sent to the Garden of the Society as the Bath Scarlet, but that name is decidedly incorrect.

The fruit is roundish, or slightly conical, light vermillion colour, above the middle size; the seeds deeply embedded, with ridged intervals; the flesh nearly white, soft, of a pleasant flavour. The leaves dense, very large; the foot-stalks tall, strong, and very pubescent; the leaflets oblong, large, sometimes concave, sometimes convex, reclined, with coarse serratures, their upper surface hairy, shining dark green. The runners are strong, green, and numerous. The scapes half the length of the leaf-stalks, upright, with closely pressed pubescence; the peduncles short; the flowers of moderate size, with narrow petals, opening late. Its leaves remain very perfect during the winter.

This Strawberry is not a productive kind, but it comes into bearing rather late in the season, and produces handsome fruit, which is however so tender that it bears carriage very ill.

25. *Cockscomb Scarlet Strawberry.* Was raised in 1808 by Mr. John Wilmot, of Isleworth, from a seed of Keens' Imperial. Its origin would place it among the Pines, but its greater affinity to the Scarlets has given it its present station. From some specimens which were exhibited to the Horticultural Society in 1821, a notice* of this variety was published; it was then a novelty.

It is a good bearer, coming in late. The fruit is large, compressed, with a furrow along the apex, which appears in the shape of a simple indenture when the berry does not put on a cockscomb shape; the early berries are very large and most completely cockscombed, so much so, as to enclose the calyx within the fruit by surrounding the end of the peduncle; the colour is bright scarlet; the seeds are pale, slightly embedded, between flat intervals; the flesh is pale scarlet, solid, with a large core, well flavoured, but without acid. The calyx is spreading. The footstalks of the leaves are crooked, strong, almost smooth; the leaflets very large, nearly round, slightly folded together, with very large coarse serratures, their texture thicker than that of most other Scarlets, the upper surface rough, shining dark green. The runners strong and few. The scapes half the length of the footstalks, usually appearing as if two were united; the peduncles stiff, not long, nor much branched; the blossoms are large and late.

This is a curious Strawberry, and most remarkable in its appearance. A rich soil is required to grow it in perfection. In habit it approaches Wilmot's Late Scarlet, but its leaves, though thick, are of thinner texture and more uneven surface. Large berries of it when formed into a cockscomb, sometimes

* See Hortultural Transactions, Vol. v. page 262.

measure three inches along the apex. It is a free grower, but will not bear under glass. Its size and peculiar shape will always make it an object of attraction.

26. *Wilmot's Late Scarlet Strawberry.* Was also raised by Mr. JOHN WILMOT, of Isleworth, about the year 1815. Specimens of the fruit were first exhibited to the Horticultural Society in 1817, and a short notice* of the variety was published afterwards in the Transactions.

Synonyms.

Wilmot's Scarlet.	Large Virginian.
Wilmot's new Scarlet.	Late Virginian.
Wilmot's Seedling.	

It is a good bearer, ripening late enough to succeed the Old Scarlet, and producing its berries in succession, so as to afford a continued supply. The fruit is very large, bluntly conical, irregularly shaped, shining light red; the seeds are small, deeply embedded; the intervals ridged; the flesh white, hollow in the centre; the flavour moderate. The calyx incurved. The footstalks of the leaves are tall, strong, slightly hairy; the leaflets large, nearly round or oval, flat, deeply serrated, the texture very thick, the upper surface without hairs, shining dark green. Runners few, brown on the upper side. Scapes the length of the footstalk of the leaves, slightly pubescent, stiff and standing up amongst the leaves; peduncles much branched; flowers large and late. The fruit is frequently much paler on one side than on the other.

In general appearance this variety is more like a small Pine than a Scarlet. The plants require good space in a bed,

* See Horticultural Transactions, Vol. iii. page 115.

The fruit is soft and delicate, and to be tasted in perfection, should be eaten as soon as gathered; it will not bear carriage.

Class II. Black Strawberries.

1. *Old Black Strawberry.* This kind is of many years standing in Gardens; it has long been well known, but neglected, and frequently abandoned, in consequence of its unproductiveness.

Synonyms.

Black.	**Turkey Pine.**
Black Canterbury.	**Black Beacon.**
Black Pine.	**Mulberry.**

Some names under which this Strawberry was received belonging to other kinds, have not been noticed, because being very distinct in its character from all others, such mistakes, when they exist in a garden, will be so easily rectified that it is not worth while to record them. It has been called the Beacon from a person of that name in Yorkshire, with whom it is said to have recently originated; it is possible that a seed of the Black Strawberry may have reproduced itself exactly, and thus have justified this claim to originality, but that the sort was so obtained cannot be admitted, for it is known to have existed not less than forty years, probably much longer. The name of Mulberry was doubtless applied to it from the dark colour of its flesh and juice, but that name belongs to another variety, described hereafter.

It is a very indifferent bearer, except in certain situations. The fruit is late, and is produced close to the ground. The berries are middle sized, conical, elongated and pointed, with

a neck, hairy, of a very dark purplish red next the sun, where the seeds are of the same colour, it is paler on the other side with yellow seeds; the intervals between the seeds are scarcely elevated; the flesh is scarlet, firm, with a core, buttery, very rich, and highly flavoured. The calyx is large and reflexed. The footstalks of the leaves are tall, weak, very erect, slightly hairy; the leaflets very small, oblong or oval, with blunt serratures, of very thin texture, their upper surface slightly hairy, shining light green. The runners numerous, large, reddish on the upper side when exposed to the sun, rising upwards at first and not trailing. The scapes are very short, stiff, hairy, with long peduncles, bearing large blossoms. The leaves of this and others of the same Class remain tolerably perfect during winter.

The very superior and peculiar flavour of this Strawberry entitles it to much attention, and but for its unproductiveness it would be extensively grown. It has been the means, either from its seeds, or by its pollen impregnating other kinds, of supplying us with many of the finest and best novelties which have been produced within the last few years. Old plants of this variety of three or four years standing, left undisturbed, are said to bear much better than younger ones. The plants are tender, and apt to die in winter.

2. *Pitmaston Black Strawberry.* Was raised by John Williams, Esq. of Pitmaston, and sent to the Garden of the Society as the *Late Pitmaston Black*, to distinguish it from another kind, which was called the Early Pitmaston Black, but that being now placed (according to its affinity) among the Scarlets, the necessity of an addition indicating its time

of ripening no longer exists. This variety first bore fruit at Pitmaston, in 1808. It was produced from seed of the Old Black.

It is a good bearer, ripening about the same time as the Old Black. The fruit is of moderate size, ovate, with a neck, slightly hairy, of a very dark purplish red next the sun ; the seeds are slightly embedded in the skin; the flesh is solid, scarlet, very firm, buttery and richly flavoured. The calyx is large and reflexed. The leaves are nearly similar to those of the Old Black, but rather weaker, the surface not so much furrowed, of a more shining green and thinner texture. The scapes are very short, stiff, hairy, branched, with short peduncles, and blossoms like its parent.

It is an excellent Strawberry, very closely allied to the Old Black, which it surpasses in productiveness, but is apparently tender, and rather a shy grower. Mr. WILLIAMS, who transmitted the plants, reported that he considered the kind more hardy, and that it stood the winter better than its parent.

3. *Gibbs's Seedling Black Strawberry.* Was received from the nursery of Mr. THOMAS GIBBS, at Ampthill, in Bedfordshire, it having been raised by him in 1818, from seed of the Old Black.

It is a moderate bearer, but more productive than its parent, ripening rather late. The fruit is conical, small, hairy, with a neck, when ripe very dark purplish red next the sun ; seeds slightly embedded in the skin ; the flesh scarlet, firm, very highly flavoured. The calyx is large and reflexed. The footstalks of the leaves, dwarf, upright, weak, slightly hairy ; the leaflets are very small, elliptical or oblong, with fine

serratures, and of very thin texture, their upper surface hairy, and much furrowed. The runners are large, numerous, and brownish The scapes very short, stiff, hairy, branched, with short peduncles growing in clusters; the flowers are similar to those of the Old Black.

In habit it resembles the Old Black, but its fruit is considerably smaller, and its leaflets are longer and more furrowed. Where variety is desired, it will be worthy of cultivation.

4. *Downton Strawberry.* Was raised by the President from a seed of the Strawberry, called Knight's Large Scarlet, impregnated by the pollen of the Old Black. Amongst the seedlings described in the third volume of the Transactions, at page 207, this was *Number* 7. In the summer of 1819 specimens were exhibited to the Horticultural Society, and a figure and account of the variety, there called the Downton, from the seat of Mr. Knight, where it was produced, were published in the Transactions.* It was subsequently very extensively distributed by him through the medium of the Society, and is now in very general cultivation. A further notice of it was also published† by the Society in 1820.

Synonyms.

Knight's Seedling.

Knight's Strawberry.

It is an abundant bearer, coming in late, and as it ripens its fruit in succession, lasts a considerable time. The fruit

* See Horticultural Transactions, Vol. iii. page 396.

† See Horticultural Transactions, Vol. iv. page 197.

is large, ovate, with a neck, slightly downy, the early fruits in good situations become conspicuously cockscombed; when ripe they are a very dark purplish scarlet on the side next the sun, the other side being paler, the seeds are of the same colour as the fruit on the sunned side, yellow on the other, and embedded a little in the skin; the flesh is scarlet, firm, and the flavour is very superior, but the berries should not be gathered until they acquire a very dark colour, otherwise they are sharp and less agreeable; in fact, though coloured and thus appearing to be ripe, they are not fully mature. The calyx is large, spreading, sometimes slightly reflexed. The footstalks of the leaves are very long, often reddish, hirsute, spreading, the leaflets large, of thin texture, elliptical, when young concave, but becoming convex, with large coarse serratures, their upper surface smooth, shining light green, and when young of a yellowish green. The runners numerous, very hairy, light brown on the upper side. The scapes are very long, upright, villous, stiff, branched, with short crowded peduncles; the flowers middle sized. The leaves retain their verdure and freshness during winter more than those of any other Strawberry.

The fruit preserves well, making sweetmeats of great excellence and richness. It also mixes particularly well with cream. Since its first introduction it has become a very popular fruit, and is not likely to lose any of its high reputation.

5. *Sweet Cone Strawberry.* Is *Number* 3, of the collection of seedlings described by Mr. Knight, as before mentioned, having been raised from seed of the Old Pine, impregnated

by the pollen of the Old Black. It was also sent to the Garden of the Society by JOHN WILLIAMS, Esq. of Pitmaston, with the name it now bears; he received it from Mr. KNIGHT, and has continued to cultivate it, finding it a valuable fruit.

It is a moderate bearer, ripening late. The fruit is small, cone shaped, with a neck, hairy, when ripe an uniform bright shining scarlet; the seeds prominent; flesh firm, of a brighter colour than the skin, hollow, with a small core, very rich and high flavoured, possessing both sweetness and acidity admirably united. The calyx is large, and reflexed. The footstalks of the leaves are weak, very erect, slightly hairy; the leaflets small, oval or oblong, coarsely serrated, convex, their texture thick, the upper surface smooth, shining light green. The runners few, they are reddish, and grow upwards at first, as in the Old Black. The scapes are the length of the leafstalk, weak, upright, hairy, branched, with short stiff peduncles, and flowers of moderate size.

The principal objection to this Strawberry is that it does not grow very freely, at least in the soil of the Garden at Chiswick; it would otherwise be a valuable variety

CLASS III. PINE STRAWBERRIES.

1. *Bostock Strawberry.* Was raised* by Mr. GEORGE DALE, gardener to FRANCIS TOMKINSON, Esq. at Bostock, in Cheshire. It was much cultivated by the Market Gardeners near London in the year 1819, and following years.

* See Horticultural Transactions, Vol. iv. page 508.

Either by accident or intention, the first letter of the name was changed into an R, and the kind acquired a false celebrity, as having been received from Rostock in Pomerania.

Synonyms.

Rostock.	Caledonian.
Rostock Seedling.	Vernon's.
Rostock Pine.	Montague's.
Rostock Scarlet.	Prolific Bath.
Wellington.	New Bath.
Cone.	Whitley's Pine.
Byram.	Beattie's Seedling.*

Called also, erroneously, by names to which it can have no claim, as Bath Scarlet, Chinese, Red Chili, and Devonshire Chili.

Being a recent production, it is remarkable that it should have received such a variety of names. Some of them, it will be observed, are derived from persons or places by whom and where it it has been grown. It derived its name of Vernon's from SAMUEL VERNON, Esq. of Dee Bank, near Chester, whose attention to the cultivation of Strawberries has been already noticed.† Mr. JONATHAN SALTER sold it from his nursery near Bath, under the name of Montague's, he having received it from GEORGE MONTAGUE, Esq. of Corston, near Bath ; it seems to have acquired popularity, in the neighbourhood of

* About 1811 or 1812 Mr. WILLIAM BEATTIE, the gardener at Scone, raised a Strawberry from seed, to which he gave his own name ; the parent of it he had received as the New Bath Strawberry, is doubtless the variety now under description, since the seedling so nearly resembles it as not to be distinguishable.

† See Vernon's Scarlet Strawberry, page 174.

that town, and from this circumstance has been confounded with the older kind, properly called the Bath Scarlet. Under the name of the Caledonian, this Strawberry has been much cultivated in the Midland Counties of England, and is in particular estimation about Birmingham, where, I am informed by Mr. John Linwood, the light soil of that part of the country suits the plants well, especially when it has been highly manured. It does not however stand so well as many other sorts, under ordinary treatment.

The Bostock is a most abundant bearer, ripening early for its class. The fruit very large, slightly hairy, nearly round, with a small neck; the largest fruit irregularly swelled towards the base, terminating in an obtuse point, of a dark shining red next the sun, light scarlet on the other side; seeds prominent, brown on one side of the fruit, yellow on the other. Flesh pale scarlet, firm, coarse, with a small hollow and core, without flavour. Calyx large, hairy, reflexed, sometimes spreading. The footstalks of the leaves tall, often brownish, slightly hairy; the leaflets very small, oval, slightly folded together, with coarse serratures, upper surface almost smooth, shining green. The runners, when young, ascending with an elevation similar to the footstalks of the leaves, until they become prostrate from their own weight, they are strong, numerous, reddish on the upper side. The scapes are very short, and slightly hairy, very much branched and spreading wide; the peduncles long; the flowers large and late.

The productiveness of the Bostock, which is quite extraordinary, and its disposition to bear great crops when forced, has given it a popularity which it ill deserves, for it is destitute of flavour. From the shortness of the scapes the fruit lies

close to the ground when ripe, quite covering the space round the plant, in a remarkable manner.

2. *Bath Scarlet Strawberry.* Though the characters of this Strawberry are sufficiently known to leave no doubt as to the proper application of the name, yet it was sent under such a variety of other names, and in so few instances by that which really belongs to it, as would in a less doubtful case have excited much difficulty.

Synonyms.

Bath Strawberry.	Devonshire.*
New Bath Scarlet.	North's Seedling.†
Liverpool.	Milne's Seedling.‡
Golden Drop.	

* I have been informed by the gentleman who sent the Bath Scarlet with the name Devonshire attached to it, that the cause of the use of that appellation was simply that the plants had been brought to his garden from Devonshire, but there are several instances in which the name of Devonshire Scarlet, and Devonshire Chili, have been applied to other varieties of the class of Pine Strawberries. A Strawberry called the ***Devonshire Chili*** certainly did exist many years ago, but I have not been able to ascertain correctly to which of the sorts now in cultivation the name ought to be applied; that it belongs to one of them I have little doubt, and believe it was an original name, but I regret that I cannot attach it with certainty.

† The name of North's Seedling, is given in different gardens to different varieties of the class of Pines, but I suspect that it does not belong to any distinct sort. The name originated in a nursery garden in the parish of Lambeth, which many years since belonged to a person named North, and I am inclined to think that the proprietor found an advantage in disposing of certain kinds of Strawberries as his own seedlings, in preference to selling them with their proper names.

‡ The Strawberry said to have been raised by the late Mr. John Milne, formerly gardener at Fonthill, is certainly the Bath Scarlet, and may have been

It was also erroneously sent as the Surinam, the Pine, and the Carolina, all of which are names belonging to ascertained sorts.

It is an abundant bearer. The fruit is roundish or ovate, with a short neck, scarlet, small for the class; seeds very prominent on the skin, of a dark varnished red; the flesh soft, with a large core, pale scarlet, and very coarse, without flavour. Calyx large and spreading. The footstalks short, hairy; the leaflets small, broadly oval, with deep coarse serratures, their upper surface smooth, shining dark green. Runners yellowish green, when young very hairy, numerous, brown on the upper side. The scapes very short, with spreading branches; peduncles long, stiff, and hairy; the flowers large.

Though this Strawberry has been long cultivated, it has little to recommend it; when fewer sorts existed it might have been kept for the sake of variety, but it is now surpassed by so many that even on that score it will be but seldom retained.

3. *Chinese Strawberry.* This, and the Surinam, hereafter described, are both of long standing in our gardens, perhaps they are the oldest of any of the Class, and have, I believe, long ceased to be distinguished by their original names; to decide what those were would occupy more space in this Paper than could be allowed, it being a subject requiring very extensive investigation and detail. The reasons for preferring the name I have adopted are given in a subsequent page. It is known in some gardens as *North's Seedling,* in others

produced from a seed of it. The plants so called were sent to the garden of the Society by AYLMER BOURKE LAMBERT, Esq.

as the ***Red Chili***, and ***North's Large Scarlet;*** but none of these can be strictly considered as synonyms, since they as justly belong to other kinds.

This variety is cultivated in the United States of America, for it was received from New York in 1822, under three names, supposed to be three different kinds; two of them were certainly wrong, and therefore I do not venture to give either.

The Chinese Strawberry is a very great bearer, it ripens before the Old Pine, and continues to produce its fruit for some length of time. The berries are apparently compressed, nearly round, middle sized, of a pale varnished red on the exposed side; the seeds are brown and prominent; the flesh is soft, light pink, with a great core, woolly; the flavour indifferent. Calyx large and spreading. The footstalks of the leaves slender for one of this class, hairy, dwarf; the leaflets very small, oval, sometimes oblong, concave, with irregular fine serratures, smooth, very shining dark green. The runners small, numerous, light green, brownish where exposed. The scapes short, hairy, with very long branched peduncles; the flowers large. It is decidedly deficient in all the qualities of a good Strawberry. The berries, though wanting in flavour, when in considerable quantities in a garden, and quite ripe, give out from the beds a most grateful odour, which is perceptible at some distance, and raise expectations of richness, which are disappointed when the fruit is tasted.

4. *Variegated Pine Strawberry.* A Strawberry having leaves much variegated with white, is often seen in the gardens of the curious. As a fruit it has no merit, the plants being weak, and very shy bearers. It evidently belongs to

the Class of the Pines, and as far as I can ascertain, appears to have been produced from the preceding kind or from the Surinam, but more probably from the former, for which reason it is placed here.

5. *Surinam Strawberry.* Of the antiquity, and probable change of the original name of this Strawberry, I have observed when writing on the Chinese.

Synonyms.

Red Pine.	Sutton's large.
Red Pine-Apple.	Oldaker's New Pine.

It has also been received as the *Red Chili*, the *Chinese*, and the *Devonshire Scarlet.*

It is an abundant bearer, ripening late. The fruit is very large, of a light shining red next the sun, pale on the opposite side, irregularly ovate, or round, without a neck; the seeds are yellow and prominent; the flesh firm, pale red, with a large core; flavour very indifferent. Calyx very large and spreading. The footstalks of the leaves tall, brownish when exposed, rather erect, almost smooth; the leaflets large, oval, for the most part reclined, their texture moderately thick, serratures large and coarse, the upper surface smooth, shining dark green. The runners yellowish green, brown on the upper side. The scapes remarkably short, stiff, hairy, very much branched and spreading; the peduncles long; the blossoms very large.

The fruit is entirely concealed by the leaves. Dry weather has a good effect on this kind, the flavour is more improved by its action than is the case with other Strawberries, and it is much better when grown well exposed to the sun.

The differences between the Chinese and Surinam are sufficiently obvious to distinguish them. If my classification had been extended to more minute divisions, those, with the Dutch Strawberry, would form one division, for they have much resemblance to each other. From their abundant produce the Chinese and Surinam are much grown by the Market Gardeners round London. They carry well, and will remain without much injury, if kept three days; these are essential requisites to the inferior class of vendors, by whom they are usually disposed of as Hautbois, the cry of which in the streets of the metropolis in the Strawberry season is well known. They are said to be particularly in estimation among the Jews. The names of Red Chili, and Chinese, are indiscriminately given to both sorts; though there is authority for the former it is improper, since the term Chili is appropriate to a distinct Class. I have called the first kind exclusively Chinese, giving that of Surinam, to this latter, the application of this denomination being justified by its use both among Cultivators and Nurserymen. They are found in some collections under the name of Carolina Strawberries. The important distinctions between the two kinds are, that the leaves of the Chinese are dwarf, and consequently that the fruit when ripe is visible on the plant; on the contrary, the leaves of the Surinam being very tall, conceal the fruit, which grows on short scapes. The Chinese are also early ripe, while the Surinams come into bearing later.

I have strong reason to believe that one or both of these Strawberries are the kinds which are grown for the Market both in the vicinity of Dublin and at Edinburgh. At the former city the gardens of Chapelizod produce them, and at the

latter they come into use when the season of the Old Scarlets is over.

6. *Dutch Strawberry.* This Strawberry, intermediate in habit between the Chinese and Surinam, was sent to the Society in 1822, from the garden of Sir WILLIAM ROWLEY, at Tendring Hall, in Suffolk. It was introduced there nearly forty years ago, from an old garden since destroyed in the neighbourhood, under its present name, by the gardener, Mr. JOSEPH GODDEN.

It is an abundant bearer, ripening later than the Chinese or the Surinam. The fruit is large, round, of a bright shining red on the exposed side, the other side paler; the seeds project from a polished smooth surface; the flesh is pale red, woolly, hollow in the centre, with a core, of indifferent flavour. The calyx large and spreading. The footstalks of the leaves are tall, a little hairy, somewhat erect, the leaflets small, slightly concave, of thin texture, with sharp serratures, the upper surface smooth, shining dark green. The runners small, numerous, very light green. The scapes short, stiff, hairy, much branched; the peduncles long; the blossoms large.

Though of inferior flavour, this may prove a valuable kind to the Market Gardener, its produce being not only abundant but certain; it never fails to yield a good crop, and consequently might be cultivated for sale, to succeed the Surinam.

7. *Old Pine*, or *Carolina Strawberry.* An old inhabitant of the English Gardens, and deservedly highly prized when it is treated properly, and its management well understood,

Synonyms.

Pine.	Devonshire Scarlet Pine.
Carolina.	Varnished.
Scarlet Pine.	Barham Down.
Old Scarlet Pine.	Blood Pine.
Old Carolina.	Large Pine.
Large Carolina.	Kew Pine.
Black Carolina.	Windsor Pine.
Miss Gunning's.	Cockscomb Pine.
North's Seedling.	Regent's Favourite.

It was also transmitted to the Garden of the Society under the following incorrect names, all of which certainly belong to other kinds, viz. Black Pine, Surinam, Bath Scarlet, and New Bath Scarlet.

I have, after the fullest consideration, decided on attaching the name of Carolina to the Old Pine; it certainly seems to be the principal one by which it is known in England, especially at any distance from London, though probably it originally belonged to another variety. It is somewhat singular that a Strawberry so generally known, and of such excellence, should have been confounded under such variety of names; that this however is the case is apparent from the above long list of Synonyms. I am aware that the plants to which the names of the Royal Gardens, Kew and Windsor, are affixed, have been considered distinct subvarieties, but from careful examination and comparisons of these and their supposed type, under similar circumstances, I have not hesitated to unite them. Plants of the Old Pine exist which are less productive than others, which differ in no other respect;

but this, I apprehend, will be found to be the case in every kind of fruit, which is extensively cultivated; and though the circumstance is such as ought to make the Cultivator careful in the selection of his stock, it does not justify, nor will it support, the adoption of a distinct name. The like observation is applicable to what is called the Cockscomb Pine, for all good bearing and well managed Old Pine Strawberry plants, will yield fruits of a cockscomb shape; therefore no distinction of name is necessary for them.

The Pine Strawberry is a good bearer in situations and on soils which suit it; it ripens rather late. The fruit is large, slightly hairy, with a neck, of an uniform bright scarlet, ovate-conical, occasionally compressed, and when luxuriant the early fruits are cockscomb shaped, but it will be found that the berries thus overgrown have in all cases less flavour, than those produced of the usual shape; the seeds are slightly embedded in the skin; the flesh is rich and juicy with a very grateful flavour, pale scarlet, sometimes the largest fruit have a small hollow in the centre, but they are generally solid. The calyx is large, spreading, sometimes partially reflexed. The footstalks of the leaves are tall, rather upright, stiff, partially covered with long hairs, the leaflets small, nearly oval, sometimes nearly round, spreading horizontally with rounded serratures, their upper surface almost smooth, shining dark green. The runners numerous, large, reddish, ascending at first in a nearly upright direction, in the same manner as those of the Bostock. The scapes half the length of the leafstalk, rather upright, very stiff, slightly hairy, branching, with long peduncles; flowers large and late.

This Strawberry unquestionably stands above all others in

excellence, though its flavour is not so intense or powerful as that of the Old Black and its varieties, nor so aromatic as the Hautbois; it has however a quality so peculiarly agreeable to the palate, that it must be placed in the first rank of Strawberries. It forces well under particular management, but does not bear early under glass. It is also most excellent when preserved whole as a sweetmeat. None of all the various parcels received from different places which I examined, though varying in productiveness, exhibited any distinguishing characters either in the foliage, flowering stems, blossoms, or fruit. It prefers a cool though not a shaded situation, not succeeding well where exposed to the reflected heat of the sun. It succeeds best in a stiff soil approaching to clay.

8. *Glazed Pine Strawberry.* This Strawberry came with the name of the Glazed Pine from the garden of Viscount Sydney at Frognal in Kent. Mr. Thomas Moffatt the Gardener there, received it as a valuable kind from Mr. James Grange's garden at Kingsland. It is known as Knott's Pine, about Manchester, where it is much esteemed, having been introduced to that neighbourhood some years ago by Mr. John Knott, of Chester, whose account of it is, that it was raised in the garden of Lord Delamere at Vale Royal. It was sent to the Society from Smith's nursery, near Manchester, by the proprietor, Mr. William Smith.

Synonyms.

Knott's Pine.

Scarlet Pine Apple.

It came also from nurseries in one case under the name of Chinese, and in another as the Carolina.

It is a good bearer, ripening late. The fruit is variable in shape, the largest frequently appear as if compressed, but they are generally conical with a neck, large, hairy, of a darkish shining scarlet next the sun, having the other side paler; the seeds prominent; the flesh pale scarlet, firm, with a large core; the flavour good, but inferior to that of the Old Pine. Calyx large and incurved. The footstalks of the leaves are tall, spreading or erect, red, slightly hairy; leaflets large, oval, pointed at the ends, flat or slightly folded together, with deep and coarse serratures, their upper surface almost smooth, shining light green. The runners are elevated at first, and afterwards recumbent, as in the Old Pine and Bostock, they are of a reddish colour, large and numerous. The scapes are very short, upright, hairy, branching; the peduncles very long; the blossoms large.

In habit this Strawberry is like the Old Pine, but the leaflets are of thinner texture, and reclined; it is readily known by its red footstalks. It is said to be a good forcer, and is on the whole an useful kind, though inferior to the Old Pine.

9. *Bullock's Blood Strawberry.* Was received into the collection from the late Mr. James Lee of Hammersmith, who alone, as far as appears by the notes transmitted to the Secretary, which I have inspected, appears to have possessed the variety.

It is a very shy bearer, ripening late. The fruit ovate, large, when ripe of a uniform light shining red; the seeds dark red on the exposed side, yellow on the other, projecting

from a polished surface; the flesh pale red, firm, juicy, the flavour very indifferent. The calyx is middle sized, spreading, or reflexed. The footstalks of the leaves are tall, nearly upright, almost smooth; the leaflets large, ovate, flat, with bluntly pointed serratures, their texture thick, the upper surface smooth, shining dark green. The runners numerous, reddish and large. The scapes very short, stiff, erect, almost smooth, branching, with long peduncles; flowers small.

This kind has little to recommend it to notice, its fruit being neither abundant nor of good quality. I have not been able to obtain any account of its origin or history.

10. *Keens' Seedling Strawberry.* No Strawberry that has been recently produced has excited so much attention as Keens' Seedling. It has consequently brought both fame and profit to the Individual who had the good fortune to raise it. Some of the first fruits which it produced were exhibited to the Horticultural Society in 1821, and an account, with a figure, of them was published afterwards.* It originated from a seed of Keens' Imperial.

Synonyms.

Keens' New Seedling. Keens' New Pine.
Keens' Black Pine.

A most excellent bearer, ripening early, soon after the Scarlets, and before any other of the Pines. The fruit is very large, round or ovate, some of the largest assuming a cockscomb shape, when ripe of a very dark purplish scarlet next the sun, the other side paler, slightly hairy; seeds a little

* See Horticultural Transactions, Vol. v. page 261.

embedded in the polished surface of the fruit, which has usually a furrow at the apex; the flesh is firm, solid, scarlet, without any separable core, tolerably high flavoured. The calyx is of moderate size, hairy, incurved. The footstalks of the leaves are tall, slightly hairy; the leaflets very large, roundish, for the most part flat, reclined, of a very smooth shining dark green, with coarse serratures, which are large and rounded. The runners are small, numerous, greenish yellow, and slightly hairy. The scapes are of moderate length, sometimes very short, branched, with short, weak, clustered peduncles; middle sized, opening early.

This Strawberry is a very extraordinary production, possessing beauty, size, firmness of flesh, as well as productiveness, and that at a season when no other, at all approaching it in appearance, is ripe. Though good, its flavour is surpassed by several, both in the Pine and the two preceding Classes, but in the Public Market its external properties give it a decided advantage over all the other kinds yet known. The leaflets are the largest of the Strawberry tribe, middle sized ones measuring four inches and a half across. It forces well both late and early, bearing plentifully.

11. *Keens' Imperial Strawberry.* A production of an earlier period by the Market Gardener whose name it bears. It was raised from a seed of a Large White Chili (White Carolina) Strawberry about the year 1806. Some of its produce were exhibited to the Horticultural Society in 1813, and a figure with an account of the variety, was published* in the Transactions.

* See Horticultural Transactions, Vol. II. page 101.

Synonyms.

Imperial.	**Keens' Black.**
Black Imperial.	**Keens' Large-fruited.**
Large Imperial Black.	**Isleworth Pine.**
Imperial Pine.	**Large Black.**
Black Isleworth.	**Keens' Black Pine.**

This is not an early Strawberry, but it produces usuallya tolerably good crop. The fruit is very large, roundish, sometimes bluntly pointed, when ripe of a very dark purplish red next the sun ; the seeds project from the surface of the fruit, which is shining ; the flesh is not juicy, but very firm, it is coarse, hollow in the centre, with a core, the flavour tolerable. The calyx is large, partially spreading, incurved, sometimes reflexed. The footstalks of the leaves of moderate length, stiff, spreading, slightly hairy ; the leaflets large, roundish, concave, of thick texture, spreading, with large and coarse rounded serratures, their upper surface glossy dark green. The runners are but few, they are however very large. The scapes are as long as the leafstalks, very stiff, hairy, branching much, with long, spreading, stiff peduncles ; the flowers are rather small, they are not uniformly productive, the latter ones especially being abortive.

The want of rich flavour in this variety caused it to decline in the good opinion of the generality of Cultivators, though it was very popular on its first appearance, and the introduction of Keens' Seedling, which excels it in every quality, whether peculiar to the two, or possessed in common with others, has nearly driven it from the market. The fruit of Keens' Imperial will remain fresh and good to the eye three days after it has been gathered. The plants appear to be tender.

12. *Black Prince Strawberry.* This was raised from the seed of Keens' Imperial by Mr. John Wilmot of Isleworth, in 1820. Specimens of it were exhibited to the Horticultural Society in June 1822, and a notice of it was subsequently published,* under the name of *Wilmot's Black Imperial.*

It is a good bearer, ripening early for a Pine. The fruit is middle sized, depressed-spherical, with a furrow at the apex, hairy, when ripe entirely of a very dark violet colour; the seeds slightly embedded; the skin of the fruit is highly polished; the flesh is solid, very firm, of a rich dull scarlet, with a small core, with a flavour higher than the Imperial, the juice dark. The calyx is small for a Pine, and spreading. The footstalks of the leaves are very short, almost smooth, the leaflets middle sized, nearly round, convex, with blunted serratures, the upper surface smooth, shining dark green. The runners numerous, light brown on the upper side. The scapes very short, stiff, hairy, branching much; the peduncles long; the blossoms very small.

This is one of the most singular Strawberries that has yet been raised, on account of its peculiar dark and polished surface, which gives it an appearance entirely unlike any other yet known. Mr. Wilmot states that it is one of the best forcers he knows, producing a plentiful and certain crop. In habit it approaches Keens' Imperial; the leaflets are of thicker texture, the upper surface more furrowed and convex. The whole plant is dwarf. The fruit is considerably smaller than its parent, and not so coarse.

13. *Mulberry Strawberry.* Of the origin of this fruit I

* See Horticultural Transactions, Vol. v. page 398.

have no account; it was received with its present name from the late Mr. James Lee, of Hammersmith, but it did not appear in any other list with the same appellation, nor were any of the Synonyms given below used by two persons.

Synonyms.

Mahone. King.

Cherokee.

Mr. Kirke has informed me that this kind has existed in his garden at Brompton for twenty-five years, as the Mahone Strawberry, and that it was given to his father by General Murray, who, it was said, introduced it from some foreign country. Mr. Andrew Dickson, of Edinburgh, sent it from his nursery to the Society as the King Strawberry, and it came with the name of Cherokee from a private collection. It is known in some of the Scotch gardens as the *Surinam Strawberry.*

It is a shy bearer, ripening late. The fruit is middle sized, ovate, with a short neck, when ripe a dark purplish red next the sun; the seeds are embedded slightly on the skin; the flesh is soft, coarse red, with a long core, the flavour moderate. The calyx is hairy, very large, incurved, extending over half the fruit. The footstalks of the leaves are short, spreading, and hairy; the leaflets very large, oblong, generally concave, of thick texture, with coarse serratures, the upper surface hairy and dark glossy green. The runners numerous, coarse, reddish on the upper side. The scapes short, stiff, hairy, branching, with very long peduncles, and large flowers.

It is a Strawberry not worthy of attention, but it would be a matter of curiosity to ascertain its history and origin. The leaves are particularly dwarf and spreading.

White Carolina Strawberries.

There are two distinct varieties of these Strawberries, but they do not seem to have been before distinguished by Cultivators, as I find that the names of one are indiscriminately given to the other. I therefore state the Synonyms here as common to both.

Carolina.	Chili.
White Carolina.	White Chili.
White Pine.	Large White Chili.
Large Blush Pine.	Large Pale Chili.
White Bath.	Large Flesh coloured Chili.
Large White.	

I propose to adopt the name of White Carolina, which is sufficiently expressive of the character, and is preferable to Chili, by which I shall avoid the confusion that would arise between these and the next Class, if that denomination were retained. I suppose that they are called Chilis under the impression that they were varieties of the True Chili Strawberry.

I have no account of the origin of either of these; they have doubtless been long in our Gardens, their great size and peculiar appearance having given them attractions, which could not have arisen from their flavour.

14. *Round White Carolina Strawberry.* A good bearer, but ripening late. The fruit is large, irregularly ovate, sometimes roundish, having a tendency to form a neck, of a brownish colour next the sun, the other side white; the seeds deeply embedded, with ridged intervals; the flesh soft, white,

woolly, with a large core; the flavour very indifferent. The calyx is large and incurved. The footstalks of the leaves are very long, slightly hairy; the leaflets large, nearly oval, flat, their texture thick, with serratures very coarse and blunt, the upper surface smooth, shining dark green. The runners large, light green. The scapes very short, stiff, hairy, much branched; peduncles long; blossoms large.

15. *Dwarf White Carolina Strawberry.* A moderate bearer, ripening about the same time as the Old Pine. The fruit is large, irregularly ovate, brownish next the sun, white on the other side, hairy; the seeds scarcely embedded, appearing prominent, darker than the fruit; the flesh white, soft, woolly, with a large core; flavour indifferent. The calyx very large and incurved. The footstalks of the leaves short, stout, hairy; the leaflets large, oblong, bluntly pointed at the ends, with rounded serratures, upper surface smooth, shining dark green. The runners strong, greenish yellow. The scapes remarkably short, very hairy, for the most part with three main branches supporting long peduncles, which bear large blossoms.

This is the worst of the two varieties of White Carolina. They are readily distinguishable, the last growing near the ground, whilst the foliage of the other stands high. The fruit of the Round Variety is much the largest, and has its seeds embedded; these are prominent in the other.

Class IV. Chili Strawberries.

1. *True Chili Strawberry.* This Strawberry is a native of South America, and has been in the European Gardens above

one hundred years. The stamens are usually entirely abortive, or very rarely produce anthers sufficiently supplied with pollen to fecundate the stigmas, hence the plants are rarely productive, for as they blossom chiefly after the season when most Strawberries are in flower, they have no chance of being impregnated from other kinds. A little attention however will always remedy this defect, for it is not difficult to contrive to have plants of the Roseberry or some other free and late flowering variety ready for the purpose required at the proper seasons, by being grown in a north or shaded border, from which the blossoms could be taken; or if the plants were kept in pots, they might be removed and placed in the beds among the scapes of the Chilis.

It is called in some Gardens the *Patagonian* Strawberry, and is probably known in the North of England under the appellation of *Greenwell's,* having been imported from France some years since, by a gentleman named Greenwell, and given to Mr. William Falla, of Gateshead, near Newcastle on Tyne, in whose nursery it is called *Greenwell's French,* or *Greenwell's New Giant,* Strawberry.

The fruit ripens late. It is particularly large, irregularly shaped, but usually ovate or bluntly conical, when ripe a uniform dull varnished brownish red; the seeds dark brown and projecting; the flesh slightly tinged with red near the outside, the rest whitish, very firm, hollow in the centre, with a small core; the flavour of the fruit is moderate, but it is harsh, and has an ample portion of acidity. Calyx very large, incurved. The footstalks of the leaves are tall, upright, stiff, and covered very densely with hairs, the leaflets are small, nearly oval, concave, with very obtuse serratures, the upper

surface slightly hairy, shining light green, under side very downy, their texture thick. Runners very strong and thick; the intervals between the young plants produced on them are very long. The scapes are short, strong, very villous, much branched, the branches spreading horizontally and bearing long stiff peduncles; the flowers are not very large, and they open late in the summer. The foliage of this kind mostly perishes in the winter, but the succeeding varieties which have been bred from it, keep their leaves.

It is said that the Chili Strawberry delights in a strong loam, and that in such soil it will produce a tolerably fair crop, if otherwise properly managed. It has also been suggested that if the plants were left undisturbed in the same place for some time, without replanting, and allowed to cover the whole bed with their runners, they might be more productive. The experiment is worthy to be tried.

2. *Wilmot's Superb Strawberry.* This is a new production, raised by Mr. John Wilmot, of Isleworth, in 1821, from seed of the True Chili, impregnated by the pollen of the Roseberry. It appears to be an abundant bearer, ripening late in the season, after the Old Pine, and in succession, so as to afford a lengthened supply. The first fruits are very large, irregularly rounded, ovate or flattened, sometimes growing of a cockscomb shape, the other berries are invariably round, all are hairy, pale scarlet, appearing as if polished, the seeds projecting, brown; the flesh very firm, pale scarlet next the outside, within whitish, with a small hollow in the centre, and a core. Flavour very good, buttery and rich, mixed with acid. The calyx is very large, incurved, partially spreading.

The footstalks tall, hairy, rather strong; the leaflets small, nearly round, with small blunt serratures, their texture thick, the upper surface very smooth, shining dark green. The runners numerous, very strong, thick, and hairy. The scapes are the length of the footstalks, stiff, very hairy, upright, and much branched or divided; the peduncles very long, the truss consequently appears large, and it is also considerably elevated above the leaves before the berries swell, but after it is bent down by their weight; the blossoms are large, and produce fertile anthers.

This is a Strawberry of great promise, the fruit is very beautiful and of extraordinary size; one that I had an opportunity of examining measured six inches and a half in circumference. The crossing seems to have produced all the change that was necessary to the Chili Strawberry, it has added to it beauty, productiveness, colour, and flavour. The plant itself is stronger and more vigorous than its female parent.

3. *Yellow Chili Strawberry.* This is a new variety, raised from seed of the Old Chili, impregnated by the pollen of the Downton Strawberry, in the garden of John Williams, Esq. of Pitmaston, by whom it was presented to the Society's Garden. It bore fruit first in the year 1821.

A plentiful bearer, ripening late. The fruit is very large, irregularly ovate, frequently compressed, and sometimes cocks-combed, brown on the exposed side, and yellow on the other; seeds brown, slightly embedded, with flat intervals; flesh very firm, buttery, yellowish, with a core; flavour very rich, with some acidity. The calyx is large, and incurved. The foot-stalks of the leaves are tall, and hairy. Leaflets middle sized,

broadly elliptical, with small rounded, bluntly pointed serratures, not so thick in substance as Wilmot's Superb, their upper surface smooth, slightly hairy, dark green, less rugose and not so much cupped as in the Old Chili. The runners middle sized (for this tribe) rising upright at first, and afterwards becoming recumbent, like those of the Bostock and Old Pine, their upper side is brownish. Scapes very short, stiff, somewhat erect; the peduncles long and branched; the blossoms larger than those of the Old Chili; the anthers large and abounding in pollen.

The fruit frequently attains a great size, weighing upwards of an ounce. Mr. Williams observes that the flavour of this Strawberry depends much on the season; in the warm dry summer of 1822 it attained great perfection. The under side of the fruit, when mature, became of a fine yellow colour, and the taste of the flesh much resembled that of a very fine ripe Pine Apple.

The production of fine and valuable Strawberries from the Old Chili by impregnation with other kinds which bear perfect pollen, of which I have here recorded two recent instances, is likely to afford an entire new stock of varieties to our gardens; they will have the merit not only of beauty and flavour, but will produce fruit at a period of the year, when we are without the luxury of Strawberries, except what the Alpines and retarded or transplanted Scarlets afford.

Class V. Hautbois* Strawberries.

1. *Common Hautbois.* Bearing male and female flowers

* I have adopted a mode of spelling the general name of this Class, which has not been much used until lately; in the older gardening books it is usually called Hautboy. The name is probably derived from the circumstance of the scape

on different plants. This is the original type of the Class from which the improved varieties have proceeded, and being in fact a most unprofitable sort ought to be eradicated from our gardens, and would probably have been so, but it has always been thought necessary to keep a stock of the male flowering plants as an essential part of the plantation of a bed of Hautbois.

Synonyms.

Hautbois.	Diœcious Hautbois.
Old Hautbois.	Hautbois, or Musky.
Original Hautbois.	

The footstalks of the leaves are of moderate length, very hairy; the leaflets middle sized, ovate, very deeply and sharply serrated, their texture thin. The runners numerous and small. The scapes tall, upright; the peduncles short, clustered; the calyx very small; the blossoms small. The flowers called the males, producing occasonally a small imperfect fruit with projecting seeds; the female flowers bearing a small spherical fruit, similar, but inferior, to that of the Globe Hautbois. The male plants retain their old leaves sometimes, but the improved varieties lose them, having only a few short and young leaves continuing alive on their roots during the winter.

It has been usual, and strongly recommended, to introduce into every plantation of Hautbois Strawberries, plants of the males of this kind; these produce runners very abundantly and the increase of these sterile plants has made the beds unproductive. To avoid this, if such adventitious aid be con-

which bears the fruit standing higher than the leaves, and consequently being called Haut-bois.

sidered necessary, it would be better to have a separate and contiguous plantation of the male plants, and not to allow of any intermixture of their runners, or they might be planted in pots, and when in blossom placed where they were expected to become useful. But I doubt if any assistance of the sort is requisite; all the varieties of the Hautbois in the garden of the Society last season were remarkably productive, and even the Globe Hautbois, which usually has been supposed to require the proximity of the male plants, bore as well as others, and yet none of these had been introduced when the beds were formed. They were probably fecundated by the pollen of other varieties which produce hermaphrodite flowers with perfect stamens.

2. *Globe Hautbois.* The Synonyms applied to the Old Hautbois are equally referable to the Globe Hautbois, and are consequently not repeated.

This is at all times but a moderate bearer, and possesses no good quality which is not to be found in the other kinds. It was the first improvement on what was in fact the Old or Original Hautbois, the names of which seem to have been transferred from that to this kind.

The fruit is nearly spherical, small, becoming dark purple when ripe; the seeds prominent; the flesh greenish, firm, with a separable core, flavour good, with the aroma peculiar to the Class. Calyx reflexed, very small. The footstalks of the leaves very tall, strong, upright, and hairy; the leaflets small, oblong, spreading horizontally, pointed at the ends, with irregular small serratures, the upper surface shining yellowish green. The runners small, numerous, light brown

on the upper side. The scapes longer than the leafstalk, very hairy and upright; the peduncles weak, hairy, not much branched; the flowers small, with imperfect stamens.

3. *Black Hautbois.* This kind was received, as a *New Hautbois,* from the Royal Gardens at Windsor, where, as I learn from John Aiton Esq. it was raised about the year 1815, from the seed of the Prolific or Conical Hautbois; it is grown in the public gardens round London, but not distinguished by name, for it was sent from them as the Old Hautbois, the Common Hautbois, and as the Hautbois simply.

In the general appearance and character of its leaves it resembles the Globe Hautbois, except that the leaflets are less concave between the nerves. The fruit is conical, more lengthened than in the Prolific Hautbois, of a very dark dingy purple colour when ripe; the seeds scarcely embedded; flavour high and flesh buttery. The calyx is small and reflexed. The scapes are much shorter than the leaves, peduncles branched, the partial ones short; the flowers very small, similar to those of the Globe Hautbois.

This kind is a great bearer, and rather earlier than the others, occasionally producing a few berries in the autumn. It is a valuable variety.

4. *Prolific* or *Conical Hautbois.* This kind was brought into notice several years ago, in consequence of its having been cultivated in the garden of the late Sir Joseph Banks, at Spring Grove. It is however of older standing, and it is not easy to ascertain why it was not generally cultivated before it was so noticed.

Synonyms.

Double Bearing.	Dwarf.
Hermaphrodite.	Sacombe.
Hudson's Bay.	Sir Joseph Banks'.
Musk.	Spring Grove.
Regent's.	

Of the above synonyms that of the Musk, I conceive, is applicable to every Hautbois, for they are described by Botanists as being "fructu moschato." It came with the name of the Sacombe Hautbois from the late Mr. James Lee, of Hammersmith, who probably obtained it some years ago from the late Garden of the Society at Kensington, to which it had been sent as an improved variety from the Garden of George Caswall, Esq. at Sacombe, in Hertfordshire. Why it is called the Hudson's Bay Hautbois I have not ascertained. The species is stated by Miller to have come originally from North America, but I suppose that this particular variety is the result of cultivation on this side of the Atlantic.

This is certainly the best of all the known Hautbois, and where only one variety is kept should be preferred to the others. The fruit is large, conical, shorter and more obtuse than in the preceding, the colour of it is dark, but not so deep as in the Black Hautbois; the seeds are slightly embedded, the flesh solid, greenish, and high flavoured. The calyx is small, and reflexed. The footstalks of the leaves are tall, upright, slender, hairy, the leaflets middle sized, slightly folded together, irregularly oblong, with coarse serratures, of thin texture, their upper surface ridged, hairy. The runners small, numerous, brownish on the upper side. The scapes shorter than the footstalks; the peduncles branched, the partial ones

shorter than in the Black Hautbois; the flowers the largest of the Class yet known, with numerous stamens.

A very abundant bearer, and it usually produces a partial second crop, blossoming in August and September, and the fruit ripening in October, or later if the season is fine; the autumnal berries are much larger than the summer ones, and nevertheless high flavoured. This variety is said to force better than any other.

5. *Large Flat Hautbois.* This kind has been hitherto but little known in the gardens near London, it seems to have been more common in the vicinity of Bath, and was first brought into the notice of the Society by Sir Samuel Young, Bart. who communicated plants and specimens of it from his garden at Formosa Place, near Maidenhead, in Berkshire. He received them in 1809 from Mrs. Lowder of Lansdown Crescent, Bath, who obtained them from the garden at Warwick Castle.

Synonyms.

White.	Formosa.
Bath.	Lowder's.
Salter's.	Weymouth.

It was also sent as the *Prolific Hautbois*, but that name is more appropriate to the preceding kind.

The fruit is roundish, depressed, light red and pale on the under side, large, the flesh greenish, without core, juicy, but though delicate, not so high flavoured as the other; seeds embedded on the skin. The calyx reflexed. The footstalks of the leaves are short, stiff, upright, hairy; the leaflets very large, irregularly ovate, with rounded serratures, their texture

thick, upper surface slightly hairy, shining yellowish green, the spaces between the nerves flattish. The runners small; numerous, brownish on the upper side. The scapes nearly as long as the leaves; peduncles regularly branched, very short, strong; flowers large, but smaller than in the Prolific Hautbois.

A good bearer, coming into fruit rather later than the other kinds in the Garden at Chiswick. At Formosa, the soil of which is particularly favourable for Strawberries, it is a more abundant bearer than any other Hautbois, and ripens earlier than the kinds cultivated there. The calyx is slightly embedded in the fruit, by which circumstance it is readily distinguished. It produces in mild seasons, a few autumnal fruits.

I have thus completed my undertaking as far as I proposed from the observations made in the last season, and have furnished descriptions in the five first Classes as follows:

Of Scarlet Strawberries - - - - -	26
Of Black Strawberries - - - - - - -	5
Of Pine Strawberries - - - - - - -	15
Of Chili Strawberries - - - - - - -	3
Of Hautbois Strawberries - - - - - -	5
Total	54

I make no doubt that with the addition of the two remaining Classes which I have not noticed, and of the varieties of the other Classes yet undescribed, which are either at present in the Garden of the Society, or which, though existing, have not reached us, that the list may be extended to near one hundred kinds.

When a perfect knowledge of all has been obtained reduc-

tion of the numbers will be the immediate consequence, for when Cultivators become acquainted with the characters of the whole, they can make their selection without hesitation or anxiety, because they will be certain that their choice will fall on the sorts possessing the properties most desired, and the consequence will be the rejection and ultimate annihilation of those of inferior merit.

A good selection of kinds from the contents of this Paper would consist of the following.

Scarlets—Old Scarlet, Roseberry, Carmine Scarlet, Grove End, Duke of Kent's, Grimstone, American, Hudson's Bay, Cockscomb, and Wilmot's late Scarlet.

Blacks—Pitmaston and Downton.

Pines—Bostock, Surinam, Old Pine, Keens' Seedling, and Round White Carolina.

Chilis—Superb.

Hautbois—Prolific and Flat.

If to these twenty sorts, were added plantations of Red Alpines and White Alpines, the whole would form a more perfect collection of Strawberries than has probably ever existed together in any one garden. It is to be observed that flavour has not been the only property attended to in the above selection; certain kinds, though deficient in that important point, have been included because of their superior productiveness; it being considered that quantity, as well as quality and variety, is usually required.

At the beginning of this Paper I intimated my intention of attempting to refer the names of the Strawberries given in the modern English books on Horticulture to the kinds cultivated in the Garden of the Society. I now proceed to do

so, as far as I am able, but it is a task of some difficulty, and I think nearly impossible to be performed with certainty, for I am satisfied that many of the lists in these books, meagre as they are, were neither founded on practical knowledge nor on the information of persons in any way acquainted with the subject.

The works I shall examine are the following;—I believe they are the only ones used by persons who refer to books for instruction in matters connected with Gardening.

1st. *Mawe and Abercrombie's Every Man his own Gardener, 22d* Edition.

2d. *Abercrombie's Practical Gardener, 2d* Edition, *by Mean.*

3d. *Marshall's Introduction to Gardening, 5th* Edition.

4th. *Nicol's Gardener's Kalendar, 3d* Edition.

I have used the latest editions of each of the above named books.

Mawe and Abercrombie's Every Man his own Gardener has long been the most popular work of the kind; the last edition of it has undergone much improvement, many of the new discoveries in Horticulture having been introduced. The following Strawberries are mentioned in it. 1st. The Wood. 2d. The Scarlet (*Old Scarlet.*) 3d. The Roseberry. 4th. The Downton. 5th. The Carolina (*Old Pine.*) 6th. The Hautboy or Musky, (*Globe Hautbois.*) 7th. The Chili, (*True Chili.*) 8*th.* Red Pine, (*Surinam.*) 9th. White Pine, (*Round White Carolina.*) 10th. Red Alpine. 11th. White Alpine. 12th. The one-leaved. I have added in Italics, both here and subsequently, the proper names of what I consider to be the sorts intended to be enumerated, where any doubt could be

entertained as to what are really meant. The omissions in this and all the other lists are far more numerous than they ought to have been. Of the Wood Strawberry the White variety is not noticed. In determining what are meant by Red and White Pines, there could not be much question as to the latter, and I have considered the Red Pine to be the Surinam, having no doubt but that it is the Fraisier Ananas of Duhamel, from whence was derived the name of Pine, which having also in latter times been given to the Old Carolina, has created confusion respecting the sorts. The one-leaved Strawberry is a seedling from the Wood raised many years ago, and is now cultivated more for curiosity and ornament than for its produce.

I consider the improved edition of ***Abercrombie's Practical Gardener*** as superior for an English Horticulturalist to any of the other books more commonly used. Its list of Strawberries does not however contain any of the new sorts, but is otherwise more correct than that of the preceding work. Thirteen kinds are enumerated. 1st. Red Wood. 2d. White Wood. 3d. Green Wood, (***The Common Green Strawberry.***) 4th. Scarlet, (***Old Scarlet.***) 5th. Large Carolina, (***Old Pine.***) 6th. Musky or Hautbois, (***Globe Hautbois.***) 7th. Black, (***Black Hautbois.***) 8th. Chili, (***True Chili.***) 9th. Red Pine, (***Surinam.***) 10th. White Pine, (***Round White Carolina.***) 11th. Red Alpine. 12th. White Alpine. 13th. One-leaved. The Green Strawberry is here incorrectly placed as a variety of the Common Wood, a mistake neither originating with nor peculiar to the author, for many other writers have fallen into the same error. The introduction of the Black Hautbois, a kind but little known or distinguished, cannot be accounted for; had it not been placed as a Hautbois I should have sup-

posed that it was the Old Black Strawberry which was intended to have been noticed.

The account of Strawberries in *Marshall's Introduction to Gardening* does very little credit to the accuracy or knowledge of the writer. After enumerating, 1st. Red Wood. 2d. White Wood. 3d. Green Wood, (*Common Green Strawberry.*) 4th. Red Alpine. 5th. White Alpine. 6th. Scarlet, (*Old Scarlet.*) 7th. Carolina, (*Old Pine.*) 8th. Hautboy, (*Common Hautbois.*) 9th. Red Pine Apple, (*Surinam.*) 10th. Green Pine Apple, (*Common Green Strawberry* a second time,) he mentions "Chilis of sorts with seminal varieties, as several of the Hautboy, and one in particular of the Carolina, called the Pink-fleshed Strawberry with one leaf, a variety of the Wood and Prolific." What sorts of Chili or varieties of the Hautbois he meant to notice it is impossible to guess, and the making the One-leafed Strawberry a Carolina is an absurdity.

Nicol's Gardener's Kalendar is the Manual of the Horticulturalists of Scotland, whose application of the most common names of Strawberries differs from that of England as used in the three before mentioned works. His names are as follows: 1st. Virginia or Scarlet, (*Old Scarlet.*) 2d. Red Chili, (*Surinam.*) 3d. Hautboy, (*Common Hautbois.*) 4th. Pine Apple, (*Common Green Strawberry.*) 5th. White Bath, (*White Carolina.*) 6th. Red Bath. 7th. White Wood, 8th. Red Wood. 9th. Red Alpine. 10th. White Alpine. 11th. Carolina. Though I have referred some of these to what I conceive to be their proper places, yet as I cannot venture to decide what are meant by the Red Bath and the Carolina, the determination of these must remain unsettled.

Some apology is necessary to the general Reader and experienced Gardener for the detail entered into, in quoting the names given in these works, but it will doubtless be serviceable to those who in possessing one or all of these books may be desirous of ascertaining to which of the varieties I have described, the kinds, they have been used to read of, are to be referred. Without such an examination of the formerly published names as has now been made, it might have been supposed that sorts which are really described had been omitted by me.

For the purpose of facilitating reference to the various kinds of Strawberries described in this Paper I have added the following Index, in which the established names of each variety are printed in Roman characters, and every synonym in Italics.

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XVI. *Description of a* Greenhouse, *in the Garden of Sir* Robert Preston, Bart., *at Valleyfield in Perthshire. In a Letter to the Secretary. By Mr.* Alexander Stewart, *Corresponding Member of the Society.*

Read December 7, 1824.

Sir,

I am induced to send you the inclosed Sketch of the Greenhouse at this place, as the form and arrangement of the stages are very different from those commonly used, and which will perhaps be considered an improvement, since it combines the style of a Conservatory with that of a Greenhouse. The advantages which the stages possess over the common ones are principally in their angular form, and from the manner in which they are placed, intersecting each other, yet allowing sufficient space for a person to walk between them, either to examine or water all the plants, without interruption; and I think they display more surface to the light and air than in the common mode of arrangement. It is also obvious, that as the house fronts due south, there is no part of each stage that has not its proper share of the rays of the sun, as it passes.

It is now about ten years since the idea of making these stages struck me, and I am happy to say they have answered my most sanguine expectations, and have met with the approbation not only of my employer, but of most persons who have

seen them. It will be gratifying to me, should the plan be thought deserving the notice of the Society also.

I remain, Sir,

very respectfully,

your obedient humble servant,

ALEXANDER STEWART.

Reference to the annexed Plate.

Fig. 1. Shews the inside of the House and the back of the large stages with the trellis work forming an arched roof behind each. The whole of the trellis is covered with creepers planted between the stages, and extending up the rafters.

Fig. 2 and 3. Are sections of the stages; the larger one has a hanging shelf on a level with the bottom of the rail marked, *a, a.*

Fig. 4. Ground plan; shewing the whole of the stages and the spaces left for going between them, also the borders at the back and front of the house marked, *b, b.*

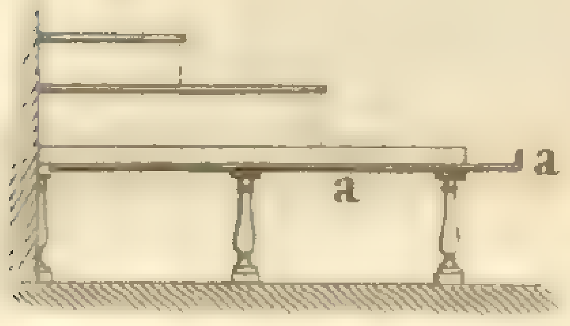
Fig. 5. The outside section at the west end, with the entrance.

Fig. 6. Inside section at the east end, shewing a niche with trellis work on each side, and a section of the stages as they intersect each other, marked, *c, c.* Three flues occupy the space behind the large stages, maked, *d, d, d.* The house is heated by two furnaces; the flue from one runs along the front of the house below the pavement and returns along the

Conservatory at Valleyfield

Fig. 1.

2



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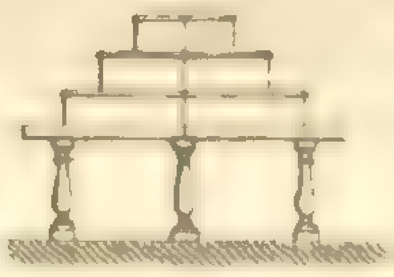
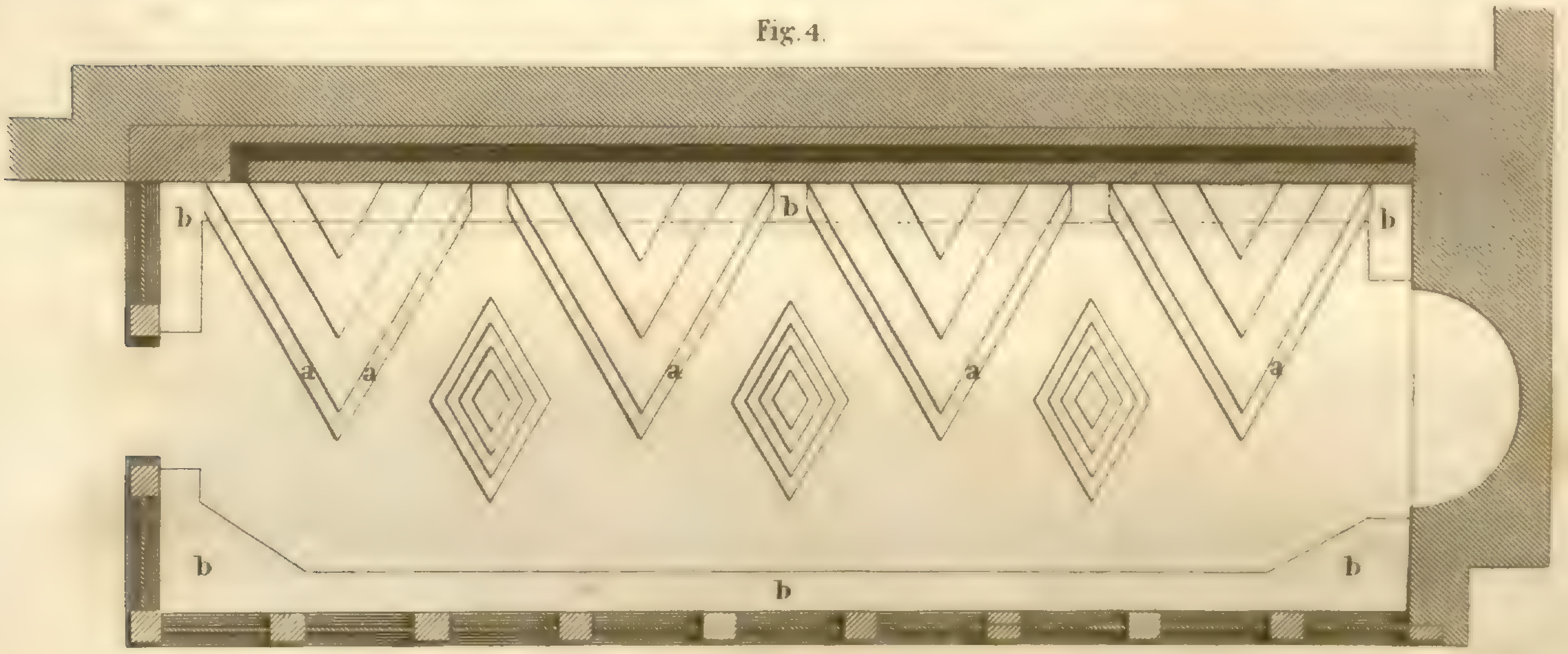


Fig. 4.



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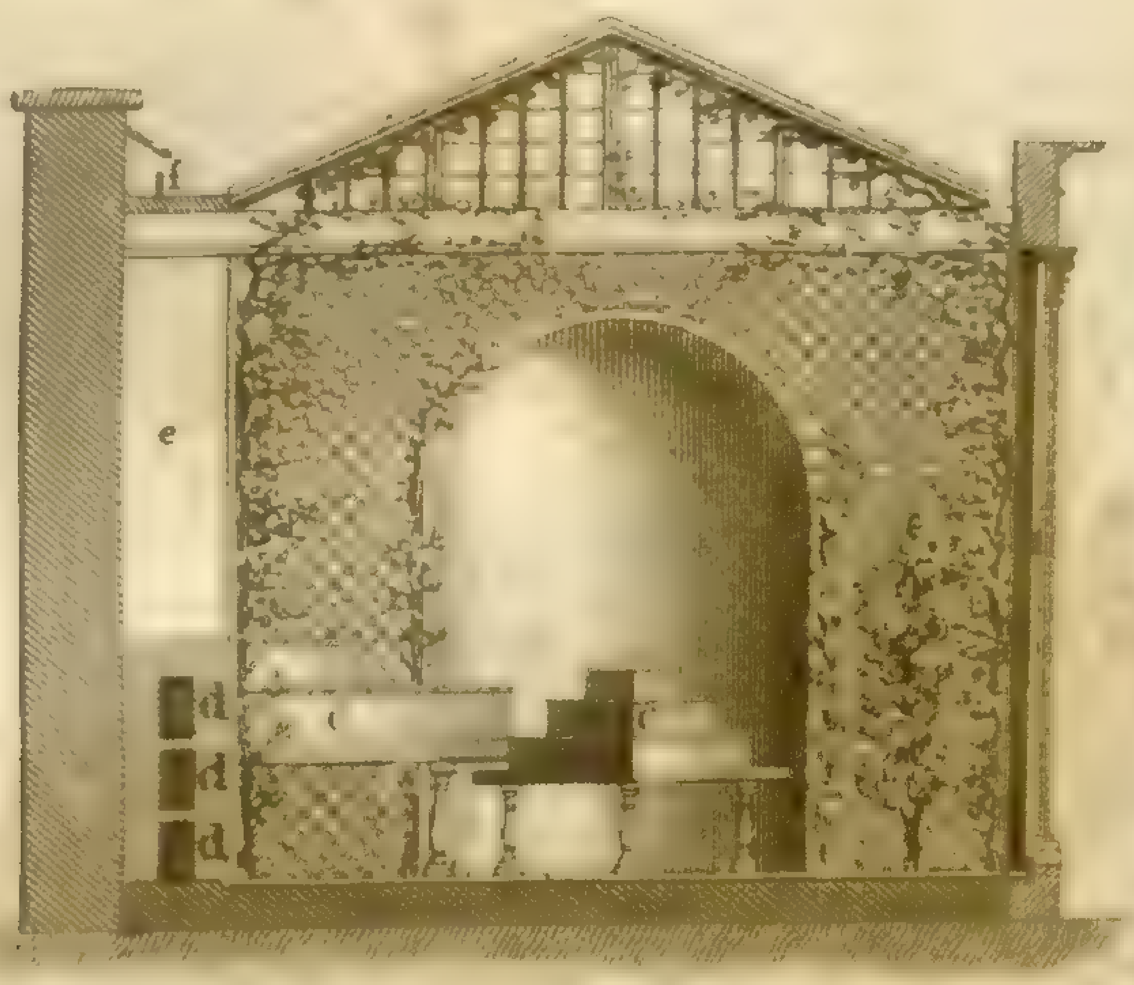

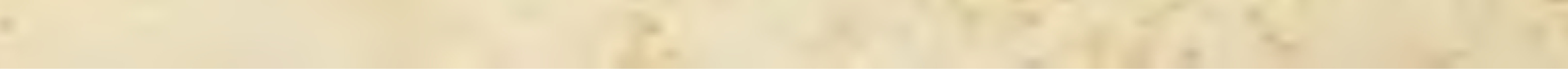

R.J. Havell, Sculp.

back wall, it is the uppermost of those marked, *d, d, d;* the other furnace supplies the two other back flues, the smoke from it passes first along the lower and returns by the middle flue. The space marked *e*, is the recess behind the stages. A ventilator marked *f*, opens by a slide two feet long by one wide; one of these is placed between each stage.

XVII. *Upon the beneficial Effects of* Protecting the Stems of Fruit Trees from Frost in early Spring. By Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read February 1, 1825.

The blossoms of Fruit Trees fall off abortively in some seasons, and produce much fruit in others, in which the weather, relatively to temperature and moisture, has been nearly the same during the flowering season of such trees; and it is in very favourable, or very unfavourable seasons only, that the gardener can, with any degree of precision, pronounce what portion of his blossoms will afford fruit. If a larger part of it, than he has been led to anticipate, prove abortive, he generally attributes its falling off to something which he calls a Blight, and which he supposes to be the operation of some unknown noxious quality in the atmosphere, during the season in which his trees have been in blossom.

Many circumstances have, at different periods, come under my observation, which have led me to draw a different conclusion, and to believe that whenever a very large portion of the well organized blossom of Fruit Trees falls off abortively, in a moderately favourable season, the cause of the failure may generally be traced to some previous check, which the motion and operation of the vital fluid of the tree has sustained.

It is well known that the bark of Oak trees is usually stript off in the spring, and that in the same season the bark of other trees may be easily detached from their alburnum, or sap wood, from which it is, at that season, separated by the intervention of a mixed cellular and mucilaginous substance; this is apparently employed in the organization of a new layer of fibre, or inner bark, the annual formation of which is essential to the growth of the tree. If, at this period, a severe frosty night, or very cold winds, occur, the bark of the trunk, or main stem, of the Oak tree, becomes again firmly attached to its alburnum, from which it cannot be separated till the return of milder weather. Neither the health of the tree, nor its foliage, nor its blossoms, appear to sustain any material injury by this sudden suspension of its functions; but the crop of Acorns invariably fails. The Apple and Pear tree appear to be affected to the same extent by similar degrees of cold. Their blossoms, like those of the Oak, often unfold perfectly well, and present the most healthy and vigorous character; and their pollen sheds freely. Their fruit also appears to set well; but the whole, or nearly the whole, falls off just at the period when its growth ought to commence. Some varieties of the Apple and Pear are much more capable of bearing unfavourable weather than others, and even the Oak trees present, in this respect, some dissimilarity of constitution.

It is near the surface of the earth that frost, in the spring, operates most powerfully, and the unfolding buds of Oak and Ash trees, which are situated near the ground, are not unfrequently destroyed, whilst those of the more elevated branches escape injury; and hence arises, I think, a proba-

bility that some advantages may be derived from protecting the stems, or larger branches, of Fruit Trees, as far as practicable, from frost in the spring; and the following facts appear strongly to support this conclusion.

Mr. Williams of Pitmaston pointed out to me, two or three years ago, an Apple tree, which, having had its stem and part of its larger branches covered by evergreen trees, had borne a succession of crops of fruit; whilst other trees, of the same variety, and growing contiguously in the same soil, but without having had their stems protected, had been wholly unproductive. I subsequently saw in the garden of another of my friends, Mr. Arkwright of Hampton Court, in Herefordshire, a Nectarine tree, which having sprung up from a seed accidentally in a plantation of Laurels, had borne, as a standard tree, three successive crops of fruit. The possessor of it, with the intention of promoting its growth and health, cut away the Laurel branches, which surrounded its stems, in the winter of 1823-4, and in the succeeding season not a single fruit was produced. Never having known an instance of a standard Nectarine tree bearing fruit in a climate so unfavourable, or nearly so unfavourable, I was led to expect that the variety possessed an extraordinary degree of hardiness: but having inserted some buds of it into bearing branches upon the walls of my garden at Downton in the autumn of 1822, I have not had any reason to believe that its blossoms are at all more patient of cold than those of other seedling varieties of the Nectarine.

I planted some years ago, in my garden, under a wall, in a north-east aspect, and shaded by a contiguous building, a Common Chinese Rose tree (Rosa Indica), and a plant of

Irish Ivy. Both have risen considerably above the top of the wall, which is thirteen feet high; and the Rose tree, of which the stem is wholly covered by the branches and foliage of the Ivy, has annually produced more abundant flowers, and exhibited symptoms of more luxuriant health, than any other tree of the same kind in my possession. The soil in which it grows is poor and unfavourable; and I am unable to discover any cause, except the protection it receives, from which it has derived its luxuriant health and growth.

Ivy is generally, I believe, known to Gardeners as a creeping dependant plant only: but when the trees have acquired a considerable age, and have produced fruit-bearing branches, these exhibit an independant form of growth, which they retain when detached, and afford very hardy evergreen shrubs of low stature. If these were intermixed with plants of the more delicate varieties of the Chinese Rose, or other low deciduous and somewhat tender flowering shrubs, so that the stems of the latter would be covered in the winter, whilst their foliage would be fully exposed to the light in summer, I think it probable that those might be successfully cultivated in situations where they would perish without such protection: and the evergreen foliage of the Ivy plants in winter would be generally thought ornamental. Detached fruit-bearing branches of Ivy readily emit roots, and the requisite kind of plants would therefore be easily obtained.

XVIII. *An Account of a* Method of obtaining very early Crops of the Grape and Fig. *By* THOMAS ANDREW KNIGHT, *Esq. F. R. S. &c. President.*

Read March 1st, 1825.

MR. ARKWRIGHT* has proved that Vines, of which the wood and fruit have ripened late in one season, will vegetate late in the following season, under any given degree of temperature; and I have shewn the converse of this proposition to be equally true;† the plants under each different mode of treatment requiring a period of rest, during which they regain their expended excitability. The following statements will shew, that Mr. ARKWRIGHT and myself have met at the same point, like navigators who have continued to proceed east and west in diametrically opposite courses, the one with an apparent loss and the other with an apparent gain of time.

A Verdelho Vine, growing in a pot, was placed in the stove early in the spring of 1823, where its wood became perfectly mature in August. It was then taken from the stove, and placed under a north wall, where it remained till the end of November, when it was replaced in the stove; and it ripened its fruit early in the following spring. In May it was again transferred to a north wall, where it remained in a

* Horticultural Transactions, Vol. iii. page 95.

† Ibid. Vol. ii. page 368.

quiescent state till the end of August. It then vegetated strongly, and shewed abundant blossom, which, upon being transferred to the stove, set very freely; and the fruit, having been subjected to the influence of very high temperature, ripened early in the present month, February. The plant will retain its foliage till April, and will not be prepared to vegetate again till late in the spring, and it is at the present period very nearly in the same inexcitable state with those described by Mr. Arkwright. This experiment will probably succeed well with those varieties of the Vine only which produce blossoms somewhat freely, and are of hardy habits; but abundant crops of fruit of these may be obtained at any period of the winter or spring by proper previous management of the plants, and by the application of a higher or lower degree of temperature.

The White Marseilles Fig, and the other white variety of Duhamel, the Figue blanche, which very closely resemble each other,* succeed most perfectly under similar treatment; and if the trees be taken from the stove in the end of May, or beginning of June, and placed under a north wall till September, and be then again transferred to the stove, they will begin to ripen their fruit in January or February, and continue to produce it till the end of May, or the beginning of June, when they should be again removed from the stove. The Figs which ripen in January and February are not so good as those ripened in more favourable seasons: but they are nevertheless very good fruit, and valuable in mid-winter; and the trees, if the temperature be proper (and they are extremely patient of heat) grow equally well in all seasons, if the roof of the stove be properly constructed, and the glass be of good quality.

* Traité des Arbres Fruitiers, Tom. i. page 211.

So small a quantity of the fruit, which is formed in the preceding autumn, of either of those varieties of the Fig, sets in any climate, that it will rarely be found to deserve much attention; and I usually prune off as much of the annual wood as is necessary to reduce the trees to such forms and sizes as I think most convenient, without paying any regard to their blossom buds. It appears probable that many of those varieties of the Fig, which will not at all bear the high temperature of a stove, in summer, may succeed well in winter, and early spring; but I have not yet had sufficient experience to enable me to decide.

XIX. *On the Cultivation of* Pine Apples. *In a Letter to the Secretary. By Mr.* William Greenshields, *Gardener to* Richard Benyon de Beauvoir, *Esq. F. H. S. at Englefield House, in Berkshire, Corresponding Member of the Horticultural Society.*

Read April 19th, 1825.

Sir,

In compliance with your request I have drawn up instructions for the management of *Pine Apples,* which correspond with my practice at this place, and I beg leave to submit them to the consideration of the Horticultural Society.

In the end of August, or the beginning of September, prepare a pit sufficiently large to contain the stock of crowns and suckers. A pit of twenty-four feet long by six feet wide, inside, will hold four hundred plants. Fill the pit with tan, or leaves, as may be most convenient, leaving sufficient room for the suckers to stand upright, without touching the glass, but no more. After the mass of tan or leaves has been levelled, lay upon it about two inches and a half in depth of old dry mushroom bed dung, or half rotten leaves, mixed with a quantity, equal to about one-fourth part of the entire mass, of light mould. Tread the whole down firm, and let it remain a few days, till the heat begins to decline. When all danger of burning is over, stick in the crowns and suckers, in rows, as thick as they will stand, and about one inch and a half deep,

patting the bed firm and even, as each row is planted. When this work is finished, shut the lights down, and let them remain closed for five or six days, but if the heat comes up very strong, a little air should be given. Shade with mats, if there be hot sun shine, but if the weather is dull, this will not be necessary. The heat within the frame must be kept to 70° and very little fresh air, except as above directed, should be admitted during the first fortnight. At the end of that time, the plants will be rooting freely, and will require more air to be given gradually, at favourable opportunities.

Through the winter, apply dung linings, to keep the internal air between 50° and 60° and protect the glass with mats during the night. If the bed should get very dry, give a gentle watering over the surface. No other care or attention will be necessary till March, the roots will then have run nearly over the surface of the bed, and consequently the plants will require potting.

Having previously prepared a pit for their reception, filled with tan or leaves, and got it to such a temperature that it will feel gently warm to the hand, take up the plants, and put them into pots of about six inches diameter for the largest suckers, reducing the dimensions of the pots according to the size of the plants. Leave on all the roots, and strip off three or four of the bottom leaves. Use deep potting, which is a great advantage to Pine plants in all stages of their growth. When the potting is finished and the plants are set in the pit, shut the lights down close, letting them remain so from four to eight days, shading in hot sun shine. At the end of that period, give a little water, and discontinue the shading, keeping the temperature of the top heat, that is, the air with-

in, to about 70° for the first three weeks, in that time the plants will be well rooted, and will then require free admission of air, and watering about twice a week, as well as frequent sprinklings with the engine, in hot dry weather. The top heat must then be maintained with dung linings to 65°, and the lights must be covered with mats at night, till the summer heat makes it unnecessary, this will be in the month of June. At that time the plants will require fresh potting into pots two sizes larger than the last. There will be no fresh tan wanted at this season for the bed; turning it over one fork deep, to level the surface, is all that will be necessary. Pot the plants with balls entire, using the mould at this and every other potting in as rough a state as possible.

When this potting is finished, reset the plants in the bed, giving them plenty of room, for they will make great progress during the ensuing two months, and if they are suffered to remain too thick, they will get drawn, and consequently be injured. After the potting give the plants a little water, and very little air, for ten days or a fortnight, to make them root freely. Subsequently, water and sprinkle freely, giving plenty of air, and always as early in the morning as possible.

Let this treatment be continued till the middle of August, or even to the middle of September, the plants will then require fresh potting into their fruiting pots. The proper sized pots for full grown plants are from twelve to fourteen inches in diameter. Prepare the Pine house for their reception by removing the old stools from it, and adding a little fresh tan to the bed, sufficient to keep up a gentle steady heat in it through the winter. Pot the plants with balls entire, and deep in the pots, stripping off a few of the bottom leaves to let

them push out fresh roots. In setting the pots, give plenty of room to the plants, for they will make considerable progress after this potting. When the setting is finished, give a little water, to settle the mould; the plants will not require any more for ten days or a fortnight after. Keep the house rather warm, to make them root freely, and then water whenever they appear dry, which is the best criterion to go by in the autumn and winter months. Give plenty of air whenever the weather permits, and sprinkle with water when the bark bed and house become dry.

Begin fire heat when the internal heat of the house in the morning falls below 60°, keeping between that and 65° to the middle of January, when a rise of 5° will be necessary. Watering often freely will encourage the plants to grow, and to shew their fruit strongly in March and April, when they will require to be moved from the bed, that a little fresh tan may be added, in order to raise the plants nearer the glass. Fork the bed over two forks deep, keeping the fresh tan quite at the bottom of the pit, and then level the surface. Before the plants are replaced, three or four of their bottom leaves should be stript off, and a little of the old mould taken from the surface of the pots, and replaced with fresh mould, raised quite to the tops of the pots. When the plants are returned into the bed, plunge the pots to half their depth only (this should be observed at all other settings, as there is nothing so injurious to a Pine plant as too much bottom heat) giving plenty of room and a gentle watering. Keep the house rather warm for the first week, till the heat of the bed returns. Give air whenever the weather will permit, watering about twice a week in hot dry weather, and sprinkle with

the engine frequently, when the house is shut up in the evening. There will be no farther attention necessary till the fruit is swelled to its full size, and begins to ripen, then all waterings should be discontinued, and a free circulation of air admitted to bring the fruit to its full flavour.

The preceding directions apply to the management of Pine Plants that are intended to show their fruit in about eighteen months after they have been taken from the mother plant, either in the state of crowns or suckers. It is necessary to add a few observations on the large sorts that do not so freely produce fruit at so early a period, but require to be kept growing through another season, especially when large fruit is required from them.

What has been above stated, however, will in every respect apply to their cultivation during the first season, until the period of the last potting in August or September. At that time the stronger kinds of Pine plants should be put into pots from ten to twelve inches in diameter, according to their size, these will be large enough for them to remain in through the winter season. The internal air of the house in which they are kept should be between 60° and 65°, till the end of January or beginning of February, when it should be raised two or three degrees, to encourage the plants to grow, and frequent waterings should be given if fire heat is applied; but if they are worked with dung linings only, they will not require so much water, for the steam from the dung will in a great measure produce sufficient moisture.

Early in March remove the plants from the bed, shake the balls entirely from the roots, and fresh pot them into pots eight inches diameter. Add a little fresh tan or leaves to the

bed, according as the heat may have previously decreased, and reset the pots in the bed. The plants must then be treated in every respect as directed before for other plants at the same season. By the middle or end of May their roots will begin to get matted, consequently they will require to be fresh potted into pots two sizes larger than the last. Before replacing them, level the surface of the bed, and in setting the pots be careful to leave plenty of room, for the plants will make great progress in growing from this time till the end of August or beginning of September, when they should be put into their fruiting pots. At this shifting they will require pots from fourteen to sixteen inches diameter. Prepare the bed as before directed, for fruiting plants. In setting, plunge the pots to half their depth, give them a gentle watering, to settle the mould among the roots, keeping the air in the house rather warm for ten days after shifting, to encourage their rooting freely, that is about 65°; and this is the temperature which should be maintained from the time of first lighting fires in the autumn till the middle of January. The mould in the pots should be kept rather dry till the middle of January, when the top heat should be increased to 70°, and water freely given to induce the plants to fruit.

What has been previously stated respecting the fruiting of other Pine plants from this time (January) to the maturity of their fruit, will in every respect apply to the subjects under present consideration, except that with them the internal air of the house should be kept three or four degrees higher during the spring months.

The rules that I have laid down in this communication all apply to the treatment of Pine plants that are intended to

give a general summer crop. Where ripe fruit is required earlier or later, the different pottings, &c. must be varied accordingly, and be done earlier or later, as the fruit may be required to come in for use at an earlier or later season.

The compost mould to be used at all the pottings should be strong surface loam and half rotten hog dung, of each equal quantities, kept as rough as possible, in which state it should be applied on all occasions. The mixture should never be used when more than twelvemonths old.

It may be here observed that no Pine plant should be checked in its progress, for the consequence of checking is always a premature and weak production of fruit.

I remain,

your very obedient Servant,

William Greenshields.

Englefield House, near Reading,
April 16, 1825.

XX. *An Account of the* Calville Rouge de Micoud. *A new Variety of Apple.* By M. Andre' Thouin, *Foreign Member of the Horticultural Society.*

Read July 15, 1823.

Nature is much more liberal in new productions than is generally supposed. In proportion to the number of cultivated vegetables in a country are the varieties of them which she produces; and notwithstanding the negligent manner in which they are observed, and the little care that gardeners are apt to bestow upon them, some from time to time escape destruction, and contribute to increase our resources and economical enjoyments. Such a one is the fruit tree which is the subject of this Paper; a seedling, and deprived of the advantages of cultivation, it has, on arriving at maturity, been distinguished for the extraordinary properties it possesses, which not only are sufficient to separate it from all our known varieties, but to render it an object of considerable importance for domestic purposes.

This Apple tree was raised from seed about forty years ago; when two years old it was transplanted into a light substantial soil, in nearly a southern aspect. On the north it is protected by an adjoining house, and is only about one hundred yards distant from the banks of the Loire. Although

planted in a garden, it has been left entirely to nature, without being subjected to the pruning knife. It has received no particular cultivation, but as the ground is turned over to within a short distance of the trunk, it derives advantage from the labour, and especially the manure which the soil receives every year, for the sake of the crops of esculents cultivated near it. Since the tree has arrived at maturity it has never failed to flower and fruit every year. It is situated on the farm of the Baroness de Micoud, which lies near La Charité sur Loire, in the department of the Lièvre.

Its first season of flowering generally takes place in April, at the same time as the greater part of the other varieties of Apples; the second is in June. The tree then ceases for a time to produce flowers; the third and succeeding flowerings take place in August, September, October, and November, when they are stopped by the severity of the frost. It is necessary to remark, that the last flowerings are much less abundant than the two first, and the fruit which they produce is small, and imperfectly ripened.

The leaves are oval, a little pointed at the end, and somewhat cordate at the base, their colour is at first bright and delicate, during the summer it becomes deep green, and about the fall of the leaf, it assumes a yellowish tint. They are smooth and shining on their upper surface, and beneath they are whitish, and covered with a slight cottony down. The blossoms are produced in corymbs of twelve or fifteen flowers in the first season of flowering, but only from five to nine in the succeeding seasons. The colour of the corolla is white, tinged with rose-coloured stains, especially on the edge of the petals.

The following is a full description of the fruit of the first crop: *Form,* depressed-spherical, near three inches in diameter across the centre of the fruit, but not exceeding two-thirds of that measure in its section from the stalk to the eye; three, or more frequently four, slight ridges divide it lengthways, and give it a somewhat square outline. *Stalk,* cylindrical, moderately thick, rather long, placed in a funnel-shaped cavity. *Eye,* formed by the five divisions of the calyx, which remain in part when the fruit is ripe, it is placed at the bottom of a cavity, scooped out like a funnel, this hollow is larger than that in which the stalk is placed. *Colour,* of a very deep and even dull red on the side next the sun, but less intense on the shaded side, where it is streaked by a few lines and spots of a pale red. *Skin,* tough, and adhering firmly to the flesh, of an austere taste. *Flesh,* yellowish white, fine, breaking with a crystalline appearance, juicy. *Juice,* sweetish acid, and agreeably perfumed. Its maturity commences about the middle of July, and continues with little interruption till November. The fruits of the April flowering ripen mostly in August, and are usually eaten during harvest. Those of the second flowering succeed the first, and may be brought to table till the end of October; they are quite as good as the first, but are not bigger than an hen's egg. The fruit of later flowerings are not bigger than a small Pomme d'Api; nevertheless, when they are stopped in their growth by the frost, they may be placed in the fruit room, where they ripen very well, and keep till November.

This Apple ripening, as I have already remarked, at a time of the year when the heat is usually considerable, and being of a sweet acid taste, is agreeable and wholesome. It is eaten

raw, but if roasted it acquires a delicate and sweet flavour; it is also very agreeable when stewed. It will undoubtedly be tried as a cider Apple, when the plants of it shall be more generally diffused. But hitherto, although the tree bears three thousand apples annually, the fruit has always been consumed as food rather than applied to purposes of beverage.

Not only will the general utility of the tree procure it a place in our orchards, but its beauty must make it a desirable object for our shrubberies. The original tree now forms a nearly hemispherical head of considerable size. The dense dark green shining foliage, gray beneath, is during three-fourths of the year enamelled with numerous bunches of delicate rose-coloured blossoms, and scattered over with fruits of which the diversity of colour and size produces an effect not less singular than agreeable.

The abundant and especially the constant disposition of this tree to produce fruit, must undoubtedly appear a phenomenon to cultivators, and particularly to those who are aware that in our natural orchards those trees which are not pruned, although producing their fruit but once a year, are usually subject to a year of rest, after a year of bearing, while this variety, on the contrary, always bears several crops yearly, without exhibiting any symptoms of exhaustion. Nevertheless, if we take into consideration the prodigious quantity of roots and fibres with which the numerous and deep principal roots are supplied, the myriads of leaves which cover the whole tree, even upon branches five years old, and the power these must have of imbibing from the atmosphere the aliment of the decending sap; if we observe the tendency of the tree to change the buds of its branches after one or even three seasons

into fruit spurs, and finally the unusual power of producing from these spurs fresh shoots covered with leaves, it will be evident that although the absorption of the nourishing juices is considerable, it is more than equalized by the additional quantity of organs provided for regenerating it. On account of the form of the tree which we are considering, the permanent ribs of its fruit, the texture of its flesh, its crystalline fracture, and especially its flavour, it cannot be placed otherwise than among the class called Calvilles, which being subdivided into three groups, characterized by the colour of the fruit, being either white, red, or variegated, the Apple we are describing should be placed in that division which has red fruit; and its large size, the colour of its flesh, the periods of ripening, which commence in the early part of summer and continue till late in the autumn, will give it a station between the summer and winter varieties.

It has been called the Calville Rouge de Micoud, in honour of the Baroness de Micoud, on whose estate it was raised. I am indebted to that lady for the communication of the notes necessary for drawing up the foregoing description, and for several plants of this new and interesting variety.

XXI. *On the Management of* Hothouse Flues, *so as to keep up a nearly equal Temperature during the Night. In a Letter to the Secretary. By the Rev.* George Swayne, *Corresponding Member of the Horticultural Society.*

Read February 1, 1825.

Dear Sir,

As often as I cast my eyes on the following admonitions* of my Gardening Directory,† viz. "His last examination of the furnace for the evening, should not be *earlier* than ten o'clock."—"He ought to be again at the fire within seven hours of the leaving it."—"Attend punctually to the furnace in the afternoon, *late* at night, and timely in the morning. Between five and nine in the forenoon never let the course of fire heat relax,"—I feel pity for those among the successors to the primitive employment of our first parents, who have to attend to the modern refinements now very generally attached to that employ, namely, the forcing department and the culture of exotics. Whilst the rest of the servants of an establishment

* These admonitions refer to the method of heating stoves by *flues;* but that of heating by *steam* is not less subject to the inconvenience of night attendance, as I understand from a letter of Mr. James Dodds (Vol. iii. of the *Caledonian H. S.'s Memoirs*, page 124) addressed to Mr. Hay, the contriver of his apparatus, wherein he tells him that in order to keep up the heat of his house to 60° he made up the fire to the boiler at 10 o'clock at night, and 6 o'clock in the morning; the substitution of the latter method, therefore, for the former, however preferable in other respects, would not less break in upon the gardener's rest by night.

† Abercrombie's Practical Gardener, by Mean, page 612-13.

are usually enjoying themselves before a comfortable fire, at some of the above periods, and in their warm beds, at others, the poor gardener is obliged to encounter the pitiless pelting of rain, snow, or hail, the cold pulses of the frosty air, or the piercing shafts of the northerly blasts, in regularly pacing to and from his furnace (in many cases no doubt at a considerable distance from his lodgings) without the allowance of a single intermission during the tedious winter.

But surely these matters may be managed otherwise. The common baking oven, after fuel has been burning therein about two hours, when the fire is removed and the door closed, retains a high degree of heat for twenty or thirty hours; * Although, in the mean time, it has been somewhat cooled by the evaporation from the bread, in baking, as well as by the door standing open whilst the same is being withdrawn, and although (as in my case) the door be of iron, which, from its known conducting quality, rapidly transmits the heat into the atmosphere in contact with it. Why then do we not adopt the *ovenian principle* (to borrow Mr. JEREMY BENTHAM'S license) in our stoves and hothouses, and by closing up the furnaces and flues, after they have been properly heated, at an early hour in the evening, and re-opening them, and rekindling the fires, at an hour not inconvenient in the morning, at once spare the gardener's nightly rest, and the master's

* In attempting to measure the heat of my oven on the morning after it had been heated in the middle of the preceding day, by placing therein a brewing thermometer, in the tube of which the mercury had the power of rising no higher than 210°, the bulb in a short time burst. The heat therefore, I think, must have exceeded that point. Having been so unfortunate, I did not make any further attempt.

coal heap? But this closure, in order to be effective, must, I conceive, be air-tight, or nearly so; and therefore cannot be made with due effect by means of the common iron furnace doors: not even by the double doors, with registers, now, I believe, pretty generally in use. Nor will iron slides (or dampers as they are commonly termed) be more efficient; for neither of these can be made to shut so close, but that air will pass through or around them. And however well-fitted we may suppose them to be, at first, they will not (from the rough usage as well as the alternate expansion and contraction to which they are exposed in that situation) long continue so; but will soon become loose and have vacuities around them. And whenever there is an aperture, even, if that aperture be on the top of the chimney, a stream of cold air will continually descend, on one side, whilst the warm is ascending on the other, till the flues and the body of air contained therein become of equal temperature with the super-incumbent atmosphere. Some other contrivance, then, becomes necessary for this purpose, which by common ingenuity, will, in most cases, be found of difficult accomplishment.

I am possessed of a small experimental stove, I may call it a diminutive one, and that this epithet is not inappropriate, I think you will allow when I state its dimensions to be only twelve feet nine inches in length by somewhat less than ten feet in width, inside measure. In the management of this little stove during the last winter (the first of my possession of it) yielding to the prejudices of my gardening servant, I suffered him to follow the directions of his books, as well as the example of his brother practitioners in the neighbourhood, by making up a large fire in the furnace, just before bed time, then damping it down, as it is termed, with ashes on the top,

and leaving the door more or less open, according to the motion of the air, otherwise the draught of the furnace. In the morning, the fire was sometimes just alive, so as to rekindle on being stirred, but more frequently it was wholly extinguished. But whether it was *in* or *out*, the temperature of the house was much the same, and always very low, in accordance with that without doors. However, by other attentions, I contrived to keep the frost out, and to preserve a few Pine plants with a tolerably healthy appearance through the winter.

But I was so very much dissatisfied with the furnace management, that I resolved, if I should live to see another winter, to put in execution the ovenian plan, which resolution the perusal of Mr. Atkinson's Paper on the management of furnaces* in the mean time tended in no small degree to confirm. Accordingly, in the month of September, I began to prepare for this new scheme of reform. First, I had the wall around the opening of the furnace and ash-hole, which had been left in a rough state, made plain and level with plaister. Next, I had to prepare a door for this opening which would shut close, and at the same time resist the heat; being averse to the use of iron for this purpose on account of its heat-conducting quality, I obtained from Bristol a large Welsh slate sufficient to cover the whole. This slate was squared, fitted, and framed with good red deal, in the manner of a ciphering slate, but more substantially. The inside of the frame (that which, when applied as a door, was to press against the wall) was lined all round with thick cloth list. It was then slung in a pulley just over the fire place, and balanced with a weight. In this state it was moveable up and down with the least exertion, and when drawn up was out of harm's

* Horticultural Transactions, Vol. v. page 467.

way. When let down it was pressed close to the wall by means of a bar; and then covered the whole of the furnace and ash-hole beneath, air tight

The next thing was to secure the other extremity, the chimney, which being topped with a chimney-pan, I had only to get a moveable cover to fit the latter. Here, I could not, on account of the exposure to the weather, well dispense with the use of some metal, and therefore had an iron cap made for the pan, with a loop on its summit, a standard of the same metal was fixed in a stone beneath, on the top of which a cross bar traversed on an axis (in the manner of a weighing beam), with a hook on one end, on which the cap was hung. From the other end, which was nearly balanced by a leaden weight, a wire was appended which reached to the fire-place, in the shed, by means of which the cover was moveable on and off at pleasure. To render this cover air tight, as well as to obviate the conducting quality of the iron, it was lined with thick woollen cloth.

The management of this machinery is as follows; towards the evening, i. e. between seven and eight o'clock, the fire (not a large one) is made to burn briskly, for about half an hour. When it has burnt clear, the slate is drawn down and fixed to its place, with the bar; in a few seconds, the cover is let down on the top of the chimney; in this state they are both suffered to remain till eight o'clock the next morning, at which time the slate is drawn up to its place over the furnace; the ashes stirred out from amongst the cinders (or rather the charred coals) left in the grate over night, which should be done with a *wooden* stick, for the better preservation of the iron-work, and the ash-hole beneath cleansed of its contents. Then, and not before, for a reason to be mentioned

presently, the cover is drawn up from the top of the chimney and the fire is lighted. The fire is continued burning till eleven o'clock (three hours) when the flue and furnace are closed again, till about four o'clock in the afternoon. They are then re-opened, the fire kindled and kept in active combustion till about eight o'clock. By this management the fire is in action less than one-third of the twenty-four hours, consequently two-thirds of the fuel, which would be necessarily expended in keeping the fire burning the whole of that period, are saved, as well as all night attendance rendered unnecessary.

But there is another troublesome operation besides the night attendance, which this plan, if it does not entirely prevent, renders of much less frequent occurrence, and that is, the cleaning of the flues. As two-thirds less fuel are consumed, the soot produced is of course diminished, in the same proportion. But it is not the soot only, or principally, that choaks the flues, but the ashes which are carried into them by the current of air, whenever the fire is stirred or the ash-hole emptied. These ashes collect in heaps, the heaviest of them just beyond the throat of the flue, and the lighter at the different angles. To prevent which, whenever the fire is stirred or the ash-hole cleaned out, the cap should be previously let down on the chimney top for the moment. This instantly causes a recoil of the current of air, which blows out of the mouth of the furnace those ashes which would otherwise have been carried in, and have lodged in the flues. As soon as the dust raised by stirring the fire, &c. has subsided, the cap is to be drawn up again.

By the aid of this simple apparatus thus regulated, I have been enabled to keep up in my little stove through this winter hitherto a higher, more equable, and regular temperature,

and with much less trouble and expense* than I could do in the last, when the furnace was supposed to be continually in action. At no time since last September has the fire been lighted before eight o'clock in the morning, or continued after eight in the evening. Nor is it my intention to alter this regulation although the weather should become much colder than it has hitherto been.† The glazed roof of my stove is not puttied, and there is no tan in the pit, only a few common leaves on the top of it, to the depth of the bottom of the pots, the latter resting on a foundation of drift-sand and coal-ashes.

It may deserve to be noticed, that in a few minutes after the current of air has been excluded from the flue in the evening, the thermometer suspended in the middle of the house begins to rise, and continues to do so, from twenty to thirty minutes; during which time it rises from one to three degrees, after which, it becomes stationary for some time, and then gradually subsides about one degree in an hour, till the morning. When I leave the stove at eight o'clock in the evening, it ususally stands at from 65° to 70°. In the morning at the same hour, I commonly find it from 55° to 60°. Another good effect of the exclusion of the air from the flue, is, that the latter, very soon afterwards, becomes nearly of an equal temperature throughout, which is not the case whilst the air is passing through it.

* On my present plan, a quarter of an hundred of small coal suffices for the consumption of the furnace during twenty-four hours, as I have ascertained by weighing the quantity used in that space of time The cost of which, estimated according to the price of that article as stated by the President, in his Paper, *On the most economical method of employing fuel, &c. (Hort. Trans.* Vol. iv. page 156,) amounts to no more than 1½d, but I rather think it costs me about double that sum.

† The thermometer out of doors, one morning, was at 4° below freezing.

An objection may possibly be made to the trouble of so many kindlings of the fire (twice a day). But if there be a provision made, and kept at hand, of materials proper for this purpose, such as a tinder box or a phosphorus bottle, matches, and some small faggots of a proper size for the furnace, each made with a handful of dry sticks, with a few shavings or dry straw bound up with them, I presume this objection will be considered to have very little weight, for the charred coals left in the grate at closing up, being warm as well as dry, presently take fire from the application of a very small quantity of ignited matter. The flue likewise being warm, a quick draught ensues, and blows up the fire in an instant. In stoves situated at no greater distance than 50 or 60 yards from the dwelling house, the furnaces may be lighted (as mine constantly is) by a shovelfull of live coals taken from the bottom of the kitchen grate without either wood or straw.

Very serious injury is frequently occasioned in stoves and hothouses, by the flues getting over heated, from the wind unexpectedly rising high in the night, and accelerating the draught of the furnace when no one is at hand to regulate it; or from the soot taking fire, when the flues have been neglected to be cleaned in time. Under the above system, all accidents of this kind are effectually prevented from happening in the night. And should the soot take fire at any time by day it may be presently extinguished by first taking the fire from the furnace grate, and then excluding the air as above described.

I remain, &c.

GEORGE SWAYNE.

Dyrham, January 14, 1825.

XXII. *On the Culture of* Strawberries. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read May 17, 1825.

At the period when, in the last year, I addressed to the Horticultural Society some observations upon the culture of different species and varieties of Strawberries,* I had seen the successful result of other experiments; but as my experience had then been chiefly confined to a single season, I thought it better to wait for the further evidence which the present spring has afforded me.

It is, I believe, the general practice of Gardeners to select the early runners of one season, to place in pots for forcing in the following spring. Instead of these, I selected, as soon as their fruit had been gathered, the roots, which in the mode of culture recommended in my last communication * upon the subject, had borne one crop of fruit; but which had been planted too closely in their beds, to be retained there long with advantage. The roots of these, to which a good deal of mould remained attached, were retained as perfect as was practicable; but their branches, which in some varieties were become very numerous, and which in all were too abundant, were reduced to three at most in the large varieties, and to four in the smaller; and the plants were all placed so deeply in the soil, after their old and decaying leaves had been taken off, that their buds alone remained above it. Soil

* See page 101.

of extremely rich quality had been chosen for the purpose, and water holding manure in solution, was rather abundantly given to the pots; the plants I by these means obtained, apparently owing to their possessing a more copious reservoir of sap beneath the soil, afforded me a more abundant crop of fruit, and of superior quality, to that which I believe I could have obtained from younger plants. A single plant of this kind will be found sufficient for a pot, the size of which must be regulated by the habits of the variety of Strawberry.

Summer planting is, I think, always in some degree objectionable; because the plants can never have time enough to extend their roots to a sufficient depth beneath the soil, to save themselves from being injured by drought in the following spring. But as the whole extent of the soil, which is allotted to produce Strawberries, becomes, under this mode of management, every year productive of fruit, it may in some situations be the most eligible. Whenever this mode of culture is adopted, I would recommend the kind of plants above-mentioned to be selected, and to be treated in every respect, as if they were to be placed in pots for forcing; except that their roots should be made to extend as deeply as practicable into the soil in which they are planted. In summer planting I have also found great advantage in using the runners of the preceding year; these had been planted with a dibble within three inches of each other, in rows, and with intervals of only six inches between the rows, till the ground in summer was ready to receive them: a very small space was thus found to afford plants enough for a large plantation; and these having acquired greater strength, with more strong and more numerous roots, afforded a much more

copious produce in the following season than could possibly have been obtained from younger plants. By placing the plants ultimately near each other, those of the large varieties within six inches of each other in the rows, and with intervals of fourteen inches between the rows; and those of the smaller varieties within four inches of each other in the rows, and with intervals of a foot only between the rows, as large, or nearly as large a weight of fruit may be obtained, I think, from any given extent of ground, as by planting early in the spring, provided water be supplied in the spring in sufficient quantity: but the fruit will rarely rival that which will be produced by plantations made early in the preceding spring, either in quality or size; it will nevertheless excel both in quantity and quality the produce of the preceding year's runners, either in the open air or forcing-house.

Whenever Strawberry plants are wanted for very early forcing, it is advantageous that their roots should have been well established in their pots in the preceding autumn, and well preserved through the winter; but for late forcing I have obtained very good subjects by the following means. Plants which had produced one crop of fruit were taken up, as soon as all their fruit had acquired maturity, and were planted at nine inches apart, in soil which had been manured superficially only, and their roots were spread horizontally near the surface of the soil; late in the autumn the roots were as much detached from the soil as would have been requisite, if they had then been to be planted in pots, but they were replaced in the soil, till the end of February; being at that period placed in pots, they produced an abundant crop of very fine fruit. I found, under this mode of management,

pans without any apertures to permit the escape of the water to be preferable to pots, apparently owing to the finely reduced mould having more perfectly closed round the fibrous roots in the form of mud, in the pans, than in pots of the ordinary construction. In giving water to plants which grow in vessels from which it cannot escape, the Gardener will avoid supplying it in excess; but Strawberry plants whilst growing are not easily injured by any degree of moisture in the soil. It is scarcely necessary to mention, that it will be advantageous in the first, as well as in the second transplantation, not to detach the roots more than necessary from the soil in which they have grown.

XXIII. *On the Cultivation of the* Amaryllis Sarniensis, *or* Guernsey Lily. *By* Thomas Andrew Knight, *Esq. F. R. S., &c. President.*

Read December 20, 1825.

So many splendid species and varieties of Crinum, and other plants of the Liliaceous tribe, have within a few years been introduced into our gardens, that the culture of the *Amaryllis Sarniensis,* or *Guernsey Lily,* notwithstanding the unrivalled splendour of its blossoms when closely inspected, has to some extent ceased to interest the modern Gardener. I should consequently think the matter of my present communication scarcely worth sending to the Horticultural Society, if I were not perfectly confident that the same mode of culture is applicable to bulbous roots of every kind which do not flower freely (exclusive of those which grow in water), and with but little variation to plants of every kind. Wishing, however, at the present time, to confine myself to very narrow limits, I shall simply relate the experiments which I have made upon the Guernsey Lily, with the conclusions which I have drawn from the result of those experiments; and my narrative will I think be most plain and intelligible, if I confine it to treatment through successive seasons, of a single root of that plant.

The Gardener possesses many means of making trees produce blossoms; by ringing, by ligatures, and by depressing their branches, and the increasing thickness of the bark of these necessarily obstructs the course of the descending fluid, and thus tends to render them productive of blossoms. But none of these mechanical means can be made to operate upon the habits of bulbous rooted plants; and I thence inferred, that in the culture of these, I should best succeed by adopting such measures as would first occasion the generation of much true sap, and subsequently promote such chemical changes in that, as would cause it to generate blossoms; and under these impressions I made, amongst others, the following experiments, the results of which have in every respect answered my expectations and wishes.

A bulb of the Guernsey Lily, which had flowered in the Autumn of 1822, was placed in a stove as soon as its blossoms had withered, in a high temperature, and damp atmosphere. It was planted in very rich compost, and was amply supplied with water, which held manure in solution. Thus circumstanced, the bulb, which was placed in the front of a curvilinear roofed stove, emitted much luxuriant foliage, which continued in a perfectly healthy state till spring. Water was then given in smaller and gradually reduced quantities till the month of May, when the pot, in which it grew, was removed into the open air. In the beginning of August the plant flowered strongly, and produced several offsets. These, with the exception of one, were removed; and the plant, being treated precisely as in the preceding season, flowered again in August, 1824. In the autumn of that year it was again transferred to the stove, and subjected to the same

treatment, and in the latter end of the last summer, both bulbs flowered in the same pot with more than ordinary strength, the one flower-stem supporting eighteen, and the other nineteen large blossoms. One of these flowered in the beginning of August, when its blossoms were exposed to the sun and air during the day, and protected by a covering of glass during the night, by which mode of treatment I hoped to obtain seeds; but the experiment was not successful. The blossoms of the other bulb appeared in the latter end of August, and were placed in the same situation in the stove, which the bulb had occupied in the preceding winter; and I by these means obtained three apparently perfect seeds. One of these, the smallest, and seemingly the least perfect, was placed immediately in a pot in the stove, where it has already produced a plant. The old bulbs have been again placed in the stove, where they have emitted abundant foliage, and in which I do not doubt they will again generate blossoms.

In the foregoing experiments, I conceive myself to have succeeded in occasioning the same bulbs to afford blossoms in three successive seasons; by having first caused the production of a large quantity of true sap, and subsequently, by the gradual abstraction of moisture, having caused that sap to have become inspissated, and in consequence adapted to the production of blossom buds. Some Gardeners entertain an opinion that bulbs may be excited to produce blossom buds by being kept very dry, after their leaves have withered: but I believe this opinion to be wholly unfounded; and that the blossoms are always generated whilst the living foliage remains attached to the bulb.

I have made nearly similar experiments upon some fibrous rooted plants, without the aid of artificial heat, with similar, and, to me, with more interesting results, an account of which I shall reserve for a future communication.

XXIV. *Report upon the* New or Rare Plants *which have flowered in the Garden of the Horticultural Society at Chiswick, from March* 1824, *to March* 1825. *By* Mr. John Lindley, *F. L. S., &c. Assistant Secretary for the Garden.*

Read January 3, 1826.

The following Report embraces an account of such plants as flowered in the Garden of the Horticultural Society, between the month of March in the year 1824, and the end of the same month in 1825. It may be considered a continuation of the Report made in 1824, and subsequently printed in this volume of the Transactions.*

The arrangement of the subjects there adopted not appearing to require alteration, it is still adhered to.

TENDER PLANTS.

Trees or Shrubs.

I. Diospyrus vaccinioides. *Lindley.*

This is a small branching shrub, with numerous small ovate silky leaves, in their young state of a light green colour. The flowers appear singly from the axillæ of the leaves, they are small, downy, cylindrical, four-cleft, greenish-white tinged with pink; the calyx is hirsute and edged with red. The stamens are four but abortive. The ovary is ovate, three-

* See page 62.

celled, with three simple stigmas. The whole plant bears a striking resemblance to some species of Vaccinium. It was introduced from China for the Society, by the late Mr. John Potts, in 1822, it has also been received by the Society from the same country at several other times. Although referred to Diospyrus, the genus to which it strictly belongs is at present uncertain. From that genus it differs in its ovarium being three-celled, but it agrees with it in the other parts of the fructification, especially in the number of the divisions of the calyx and corolla, and of the ovules in each cell, in which respect it is distinguished from the neighbouring genera, *Maba* and *Cargilia.* The female flowers only have hitherto been seen. The plant has been published by Professor Hooker, in his Exotic Flora, tab. 139, from a drawing made in the Society's Garden. It flowers in the green-house in May and June, but will probably succeed in a cold frame, a plant against a wall in the open air having lived through the two last winters with no other protection than a mat in severe weather.

II. Ardisia punctata. *Lindley.*

This is a dwarf evergreen shrub, with coriaceous, lanceolate, stalked, crenate-toothed, thick-edged leaves, and umbels of whitish flowers, curiously dotted over with purple. It differs from *A. lentiginosa,* in the greater length of its leaves, which are not so regularly crenated as in that species, but have a somewhat toothed edge and are of a much thicker substance. This species does not ripen its berries like *A. lentiginosa.* It does not appear to have been described till it was published from a plant in the possession of the Society in the Botanical Register, tab. 827. It flowers in May and

June, and will succeed in a conservatory, but not in situations where it is subject to the influence of a low temperature. Introduced for the Society from China in 1822, by Mr. John Potts. It has since been received among the plants collected in the same country by Mr. John Damper Parks, who was sent to China by the Society, for the purpose of procuring new plants, in 1823, and returned in 1824.

III. Callicarpa rubella. *Lindley.*

Stem from a foot to a foot and half high, densely covered with a dull green down. The leaves are sessile, obovate, acuminate, cordate, rugose, crenate beyond their middle, hairy on both sides, and of a pale green colour. The flowers are of a delicate pink, and appear in dichotomous corymbose cymes which are shorter than the leaves. This is a very distinct species of Callicarpa, introduced from China for the Society in 1822, by Mr. John Potts. It is figured in the Botanical Register, tab. 883, from a drawing made in the Garden of the Society. The figure in that work represents the leaves to be regularly crenated along their whole length, while in fact the crenatures do not commence before the middle of the leaf; in other respects the figure is sufficiently faithful. A green-house shrub easily propagated from cuttings. It flowers in July.

IV. Callicarpa longifolia. *Lamarck.*

This species was sent from China to the Society, in 1822, by the industrious collector from whom the three previous articles of this Report were received, and by the above named Mr. Parks in 1824. It is an inelegant shrub, rising to the

height of three or four feet, and covered all over, except on the upper side of the old leaves, with a mealy stellated pubescence. Leaves long, lanceolate, narrowed at each end, serrated beyond the middle; flowers in small axillary cymes, which are as long as, or longer than, the leaf-stalks, of a delicate pink colour, with yellow prominent anthers. A hardy green-house plant, flowering at the same time as the last species, and readily increased by cuttings. It is not, however, deserving a place in any collection except such as is botanical. Figures of it are in Dr. Hooker's Exotic Flora, tab. 133, and in the Botanical Register, tab. 864.

V. Quisqualis Indica. *Linnæus.*

Trained to the wires of an iron curvilinear stove, so that its stem and leaves were as near as possible to the light, this plant flowered in unceasing beauty and profusion through the whole summer. From the end of March to the middle of October, the house was perfumed with its delicious fragrance and enlivened by the varying hues of its bunches of changeable orange and ruby-coloured flowers. The plant is easily propagated and cultivated, but requires the constant heat of a good stove, and a free exposure to light. Figures of this plant may be found in the Botanical Register, tab. 492, and in the Botanical Magazine, tab. 2033.

VI. Nauclea Adina. *Smith.*

Adina globiflora. Salisbury

This was sent to the Society from China in 1822, by Mr. John Potts. It is a small neat looking bush, with lanceolate acuminate stiffish glabrous leaves, with two sharp deciduous

bifid stipulæ between the leaves; and small round heads of pale yellow flowers, emitting an agreeable smell. Upon comparing this with a plant described and figured in the Paradisus Londinensis, tab. 115, under the name of *Adina globiflora,* it proves to be the same. Sir James Smith, however, considers the genus Adina referable to Nauclea, and his opinion has been adopted for the reasons given in the Botanical Register, tab. 895, where is a figure of the present plant, from a drawing made in the Garden of the Society. A green-house plant, with the aspect of a myrtle, flowering in September, and easily propagated from cuttings.

VII. Cassinia leptophylla. *R. Brown.*

This has been raised at the Garden of the Society from seed, collected in the Bay of Islands, New Zealand; and sent to the Society by Mr. Charles Frazer, in 1822. It is a low compact shrub, about two feet high, requiring the protection of a frame during winter, and flowering in August and September. The branches are very numerous, and white with down. Leaves small, spreading, linear, revolute at edge, smooth above, hoary beneath. Flowers in small corymbs, appearing in profusion from the ends of the young branches. The scales of the receptacle are tipped with a white scarious spreading membrane, which gives the involucrum an appearance of containing radiate florets. This plant is propagated by cuttings placed in fine white sand, in a very gentle heat.

VIII. Grewia affinis.

Stem shrubby with stellate pubescence. Leaves alternate, rugose, stalked, oblong or obovate, acuminate, cordate,

slightly and irregularly serrate, three nerved at base, smooth on both sides. Stipules subulate, pubescent, deciduous. Flowers pale-green in terminal racemose simple panicles, appearing by threes, and, before expansion, covered over with deciduous bractes. Rachis downy, with stellate pubescence. Outside of calyx and flower-stalks closely downy. Petals pale green, three times as short as the calyx. This plant flowered in the stove in June. It differs in having oblong or obovate leaves, from the *G. Microcos* of LINNÆUS, which, according to BURMANN's tab. 74, in the Thesaurus Zeylanicus, and Sir JAMES EDWARD SMITH's description in REES's Cyclopædia, has ovate lanceolate leaves with a long point. The *G. Microcos* is also stated by Sir JAMES SMITH to have reddish flowers, and is represented in the Thesaurus Zeylanicus, with loose many-flowered panicles, while the subject of this article has green flowers and erect few-flowered panicled racemes. Upon comparing the cultivated plant with perfect native specimens in the possession of the Society, which had been brought from China, by MR. PARKS, who collected them upon Pena Hill, near Macao, there appears to be no difference between them, except that the leaves of the wild specimens are less obovate, and their margins nearly entire. This is a plant of little beauty either in flower or foliage; it requires the temperature of a stove, flowers in June, and is propagated by cuttings without difficulty. Received by the Society from MR. JOHN POTTS, in 1822. *Arsis rugosa* of LOUREIRO seems to have some affinity to this plant, but it is not mentioned among the species of Grewia enumerated by M. DE CANDOLLE. It may be thus defined:

G. affinis; foliis obovatis acuminatis cordatis rugosis utrin-

que glabris, paniculis simplicibus racemosis terminalibus, petalis calyce multò brevioribus.

IX. Clerodendron lividum. *Lindley.*

A new species of Clerodendron, brought for the Society from China, in 1824, by Mr. Parks, who found it wild in the vicinity of Macao. It is at present a soft-wooded half herbaceous shrub, three feet high, destitute of leaves along its stem, and therefore probably a much taller plant when in perfection. The branches are round, dull green tinged with purple on one side, and covered all over with fine down. The leaves, which are seated on short downy stalks, are elliptical, narrowed towards the base, coarsely and simply toothed with a small point, slightly rough to the touch on each side, but nearly destitute of pubescence. They are strongly marked with parallel veins, which give them the appearance of being transversely plaited. The flowers appear in cymes of from three to seven flowers each, which are much shorter than the leaves. The calyx is inflated, quinquefid, with five strong angles, and coloured with dull green purple. The corolla is white, slightly tinged with purple, and not much longer than the calyx. Stamens are, after the bursting of the anthers, rigidly curled back to each side of the corolla; offering a striking example of that kind of motility, which M. Dutrochet, in his *Recherches sur la structure intime des Animaux et des Végétaux, et sur leur Motilité,* calls fixed incurvation. This is a hardy green-house plant, of a livid appearance, and little beauty. It has been figured in the Botanical Register, tab. 945, from a plant in the possession of the Society.

X. Prockia Crucis. *Linnæus.*

This shrub was raised from seeds collected for the Society at the Havannah, by Mr. George Don, in 1822; and produced its flowers in the stove in August last. The young branches are round and pubescent, the old ones nearly smooth, and covered with a light brown bark. The leaves are alternate, stalked, ovate-acuminate, equally serrated, a little cordate at base, bright green above, paler, and slightly pubescent on the nerves beneath; footstalks a third the length of the leaves, slender, hairy; stipules one third the length of footstalks, falcate, glandular at edge. Flowers in simple terminal few-flowered racemes. Footstalks long, shaggy; sepals ovate, acuminate, downy on each side, but pale on the inside, occasionally having the rudiment of a fourth sepal. Petals none. Stamens numerous, bright yellow. It is not improbable that this may be the variety of *P. Crucis*, figured by Lamarck, in his Illustrationes, tab. 465. fig. 1, and distinguished by M. De Candolle, on account of the cordate base of its leaves. But the stipules are decidedly falcate, as in the true *P. Crucis*, and the sepals generally three in number, on which account I incline to think the plant which has flowered in the Garden of the Society, the original form of the species. It is a stove plant of little beauty, easily increased by cuttings.

XI. Diplolepis ovata.

Two species of Diplolepis were described* in the Report of last year; another is now to be added, which was brought for the Society from China, by Mr. Potts, in 1822. It resembles *Diplolepis vomitoria* in its habit, but is smaller in all its parts

* Diplolepis vomitoria and Diplolepis apiculata No. VIII., and No. IX., page 68.

than that species, and has a greater disposition to produce flowers. The leaves are small, ovate, acute, covered with silky pubescence, and frequently shorter than the panicles. The stem is also hirsute, rather than silky. The species has no merit as an ornamental plant, but may be distinguished from those already described by the following character.

D. ovata; foliis ovatis acutis sericeis paniculâ brevioribus, caule hirsuto, stigmate depresso.

XII. Murraya paniculata. *De Candolle.*

This plant was sent to the Society from Sumatra, in 1823, by Sir THOMAS STAMFORD RAFFLES. It forms, in the stove, a naked arborescent shrub six feet high, with pinnated leaves, of which the leaflets are alternate, ovate acuminate, unequal, flat, quite smooth. The flowers are white, and appear at the ends of the young branches singly, or by pairs from the axils of the upper leaves, which are simple, and may more properly be termed bractes. The blossoms have a delicious fragrance, resembling that of the Orange. They are quickly perishable, and have not in this country been succeeded by ripe fruit. All the parts of the plant on being bruised emit a pleasing resinous smell. A figure from the plant in the Garden of the Society has been published by Dr. HOOKER in the Exotic Flora, tab. 134.

XIII. Blackwellia fagifolia.

Pythagorea Cochinchinensis. Loureiro.

Among the plants imported from China, by the Society in 1824, by means of Mr. PARKS, were several individuals of a remarkable plant with downy branches, and ovate serrated

bright-green alternate leaves, with linear subulate pale-green deciduous stipulæ. One of them flowered within a few weeks after its arrival; its blossoms grew in numerous axillary pendulous simple racemes, about the length of the leaves, and were of a pale yellowish-white colour, emitting a fragrant odour. They consisted of a perianthium jointed with its pedicel, having a limb divided into sixteen stellate beautifully fringed segments, and an half inferior, one-celled ovarium with four parietal placentæ, each bearing two pendulous ovules. The stamens were eight, inserted at the line of separation between the ovarium and perianthium, opposite to the segments of which they were placed. Opposite to each of those divisions of the perianthium not furnished with a stamen, was inserted a small square compressed hairy gland. The styles were four and spreading. It was therefore obvious that it was referable to the natural order of Homalineæ, from which its stellate, many-parted perianthium, in which no distinction was shewn between calyx and corolla; the glands alternating with the stamens, and the half-superior, many-styled, one-celled ovarium, with parietal placentæ, rendered it impossible that it could be separated. Upon comparing it with the few genera, yet referred to that order, it appeared not to be distinguishable from Blackwellia of Commerson, the characters of which have been amply described by Jussieu; and it therefore became a question whether the plant was distinct from the *Astranthus Cochinchinensis* of Loureiro, which has long since been determined by Mr. Brown to be of the same genus as Blackwellia. But that plant being described by its discoverer as having woolly leaves, and an ovarium absolutely superior, can scarcely be

considered specifically identified with that before us. Among the octandrous genera of Loureiro, with four styles, there is, however, a genus named by him *Pythagorea,* with his account of which this agrees in so many respects, that I think there can be little doubt of its being the species he has named *Cochinchinensis;* and I do not hesitate to entertain this opinion, notwithstanding the capsule of Pythagorea being described as consisting of four cells, because there is sufficient evidence of this plant belonging to Homalineæ, which makes a four-celled capsule improbable; and because he may have been misled by the capsule dividing into four valves, which happens in Blackwellia, and may therefore be expected in the present plant. When in blossom this is an object of much interest, not only on account of its pendulous racemes of white flowers, which burst forth from the axillæ of every leaf, and fill the air with their perfume, but also for the sake of its beautiful starry floral envelope, which, with its delicate fringe of shining white hairs, exhibits one of the most elegantly symmetrical combinations in nature. It is nearly a hardy plant, flowering in May, and appears, from dried wild specimens in the possession of the Society, to be not uncommon on the Lapa Hills, near Macao.*

XIV. Eurya Chinensis. *Abel.*

This plant has been imported from China, by the Society, by means of Mr. Parks, and flowered in February of the

* Since this Report was written, the second part of M. De Candolle's Prodromus, containing *Homalineæ,* has been received. There is not any species described in that work with which the present can be confounded; nor indeed is there any reference to Loureiro's *Pythagorea.*

present year. It is a very dense leafy bush, about two feet high, with ovate shining evergreen leaves, which cover over the flowers. The latter are small, white, slightly tinged with pink, and hang down on the under side of the branches. It is a hardy green-house plant. A figure of it may be found in the Appendix to Abel's Voyage to China.

XV. Mimosa polydactyla. *Willdenow.*

This curious species of sensitive plant was raised from seeds sent to the Society from Maranham, by Mr. George Don, in 1823. It is scarcely more than biennial, rising with hirsute stems to the height of a foot, or foot and half. The stems are furnished, besides the hairs, which are deciduous, with very stout unequal scattered compressed falcate aculei. The leaves appear to be digitate, consisting each of four pair of pinnæ, covered with an indefinite number of highly irritable linear leaflets, each ciliate with a few very fine bristles. The heads of flowers are terminal or axillary, usually solitary, reddish-purple, seated on footstalks densely covered with erect stiff hairs. The pods are short and hispid, separating into about four articulations. This plant may be raised with facility from seeds, which it produces in abundance, but it has not been propagated in any other manner. Like all sensitive plants, it requires, in order to acquire its highest degree of irritability, to be cultivated under the influence of a strong light, in a highly heated atmosphere, charged almost to saturation with humidity. The species in its native country is much more vigorous and beautiful than under artificial management in a garden.

HERBACEOUS PLANTS.

XVI. Calceolaria corymbosa. *Ruiz and Pavon.*

Calceolaria Paralia. Hooker.

For seeds of this beautiful plant, the Society is indebted to Francis Place, Esq. It is scarcely more than biennial, usually perishing after having perfected its seeds. It requires, like most of the herbaceous plants from Chile, a cool temperature, and humid atmosphere during both summer and winter. It is managed most successfully by being placed in a cold airy frame, which may be protected by mats from severe frosts during the winter. In the months of April, May, and June, it produces its brilliant yellow corymbs of flowers in abundance, and these are, under favourable circumstances, succeeded by seeds, from which, if sown immediately after ripening, fine young plants may be obtained for flowering the following summer. A native of shady places near Concepcion, where it is called by the country people *Arguenila.* This is distinct from the *Calceolaria Paralia,* described and figured by Cavanilles,* from specimens found near Paral, and communicated to him by Née. That species has a stem which is more leafy than that of C. corymbosa, and its flowers are smaller, with a longer labellum. A figure of C. corymbosa is to be found in the Botanical Register, tab. 723, and in the Botanical Magazine, tab. 2418. And also in Dr. Hooker's Exotic Flora, Vol. i. tab. 75, under the name of *C. Paralia.*

* Icones, Vol. v. tab. 447.

XVII. Costus Pisonis.

Costus spicatus ? Hortus Kewensis.

This species of Costus has been long ago described, with an expressive though rude figure, by Piso, in his History of the Medicinal productions of Brazil, page 98, under the name of *Jacuacanga,* or *Paco Coatinga.* By modern botanists, it has been confounded with the *Alpinia spicata* of Jacquin, which has yellow flowers, and an ovate, not oval, spike. The last mentioned author, who saw his own plant alive, and has given an ample account of it, pointed out the discrepancy between the yellow-flowered species found by him on the banks of torrents, in Martinique, and the red flowering Brazilian kind, described by Piso, in the work above cited. The present species was sent to the Society by Robert Hesketh, Esq. a most liberal and valuable Corresponding Member of the Society, from Maranham, in 1823. It grows to the height of three feet or more, and is clothed from its base with fleshy, elliptical, lanceolate, acuminate, sessile, smooth leaves, which become smaller as they reach the spike of flowers, which is oval, the size of a pigeon's egg, and formed of stiff, ovate, entire, densely imbricated scarlet bracteæ, out of which proceed several rose-coloured flowers, which, after remaining expanded for a few hours, close and perish. The principal beauty of these species consists in the brilliant scarlet or rather crimson colour of the spike, which remains in beauty for many weeks, both before and after the flowers are protruded. It is a tender stove plant, slowly propagated by dividing its roots. A figure of it will

be found in the Botanical Register, tab. 899, taken from a plant in the possession of the Society.

It is not known that any yellow-flowered species of Costus exists in collections in this country. It is therefore not impossible that the *Costus spicatus* of the Hortus Kewensis is a synonym of C. Pisonis.

XVIII. Leonotis intermedia. *Lindley.*

This fine plant was raised from seed collected in Delagoa Bay, and sent to the Society by the late Mr. John Forbes. It is a naked, half shrubby, herbaceous plant, about four feet high. Leaves rugose, cordate, small, much shorter than the joints of the stem; the flowers are disposed in several terminal, whorled spikes; the corolla is about an inch and a half long, covered all over with long, silky, loose, dark orange coloured hairs. Cultivated in the stove, in common soil, and easily increased by cuttings. It is figured in the Botanical Register, tab. 850.

XIX. Mentha blanda. *Wallich.*

A small herbaceous perennial plant, requiring the protection of a frame. Stem a foot or a foot and a half high, square, blunt at the angles, slightly pubescent, coloured with purple at the joints. Leaves triangular-ovate, coarsely serrated, entire at the base, nearly smooth, about the same length as the slender footstalks. Flowers white, very minute, in slender dense spikes, bracteæ subulate, length of the calyx, which is campanulate, five-cleft, nearly equal, covered with white hairs. Corolla a little longer than the calyx, downy on the outside, four-cleft, the upper lobe emarginate, the lateral entire, the lower cup-shaped, a little larger than the

others. Stamens nearly equal, distant, smooth, the length of corolla, inserted in the middle of the tube. Lobes of the stigma linear, equal. This plant differs slightly from the generic character of Mentha, and resembles, in so remarkable a degree, the genus *Elsholtzia*, of WILLDENOW, as to make it almost doubtful to which of the two it is strictly referable. The *Perilla polystachya* of the Prodromus Floræ Nepalensis,* which appears to resemble this, has lanceolate bractes, as long as the flowers, and a smooth stem. A native of Nepal, whence seeds of it were sent to the Society, by Dr. WALLICH, in 1823. The following specific character may be assigned to it.

M. blanda; foliis glabris longè petiolatis rhomboideo-ovatis grosse serratis glabris, calycibus villosis, bracteis subulatis calycis longitudine, caule pubescente.†

XX. Phalangium Nepalense.

A perennial plant raised from seeds from Gossain Than, presented to the Society, by the Honourable Court of Directors of the East India Company, in 1824. It is a foot and an half high, quite smooth in every part. The leaves erect, spreading at end, upon the upper surface glossy, and bright green, on the under side glaucous and striated, at the end blunt, with three slight nerves, and a somewhat membranous edge. A strong rib passes along the back. The flowers are pure-white, with yellow anthers, scentless, when expanded nodding, when closed erect; they appear by threes in an

* Prodromus Floræ Nepalensis, page 114.

† Since the reading of this Paper, a figure of Mentha blanda has been published by M. De CANDOLLE, in the second fasciculus of the Plantes Rares du Jardin Botanique de Genève, tab. 8.

erect, nearly simple panicle, which is rather shorter than the leaves. Scape dark-green, rounded, a little tumid at the joints. The lower bractea is long, lanceolate, of the same colour and texture as the leaves; the upper bracteæ gradually become smaller, till the uppermost are shorter than the flower stalks. The capsule is erect, and covered by the persistent remains of the perianthium. This plant flowered in a curvilinear stove, and exhibited no indication of impatience of the heat. It is however not improbable that it will be hardy enough for a green-house. It appears to have some affinity with the *Phalangium ramosum* of KER, but it is not very similar to any species previously described. It may be thus defined.

P. Nepalense; foliis lineari-lanceolatis scapi longitudine, paniculâ simplice, bracteâ inferiore longissimâ subtus glaucâ, perianthii laciniis patentibus oblongis obtusis:

XXI. Gloriosa virescens. *Lindley.*

Roots of this species of Gloriosa were received in 1823 from the late Mr. JOHN FORBES, along with a miscellaneous collection of seeds and plants from the eastern coast of Africa. The leaves and stem are similar to those of *Gloriosa superba,* but the tendril at the end of the leaf is not so long. The flowers are a dull yellow-green colour, slightly tinged with dull red, but never acquiring the brilliant orange colour of *G. superba;* the segments are undulated, but less so than in *G. superba,* and only towards their extremity. It probably is the same as the variety of *G. superba,* described by LAMARCK, as having been found in Senegal, by ADANSON. In the collection of dried plants from Mozambique, sent home by Mr.

Forbes, are specimens of this plant, with which the plant that flowered in the Garden of the Society, agreed in all its characters. A figure may be found in the Botanical Magazine, tab. 2539.

XXII. Arthropodium minus. *R. Brown.*

A tuberous rooted plant, about eighteen inches high, leaves linear-lanceolate, erect, of a pale glaucous green, quite smooth, and shorter than the panicle. Panicle slightly compressed, very slender. Flowers about two together, or solitary, pendulous, pure white; the tuft of the stamens yellow, the anthers purple. A hardy green-house plant, flowering in July. Raised from seed sent to the Society from New Holland in 1823, by Mr. Charles Frazer. A figure, from a plant in the possession of the Society, is in the Botanical Register, tab. 866.

ORCHIDEOUS PLANTS.

XXIII. Catasetum Claveringi. *Lindley.*

This noble species of Catasetum was brought from Bahia de S. Salvador in 1823, by Mr. George Don. It is a parasitical plant, consisting chiefly of a cluster of oblong bulbs, covered with the remains of the dry sheaths of the leaves of former years. The leaves are long, lanceolate, plaited and wavy, of a bright green, slightly spotted with purple towards their base. The flowers are disposed in a spike, upon a radical scape, which, together with the flowers, is about half the length of the leaves. The flowers are very large, somewhat globular, quite free from pubescence, and having a powerful but pleasant smell of honey; on the outside they are dingy green, in the inside they are banded with irregular spots of a rich purple, like the flowers of some kinds of *Stapelia.* The labellum

is very fleshy and solid, and overshadows the inside of the flower like an helmet; in the inside it is bright yellow, on the outside pale green. The column is very large, beautifully spotted with purple, and has two long cirrhi in front, which being longer than the columna, lie coiled up in the bottom of the labellum. A robust stove plant, flowering in September; in its native country, it is found upon the stems of living trees. It, or a neighbouring species, has been received by the Society from Robert Hesketh, Esq. His Majesty's Consul at Maranham, growing upon the live stem of a young palm tree. This species has been figured, and described in the Botanical Register, tab. 840, from the plant which flowered in the Society's collection. It has been named after Captain Douglas Charles Clavering, F. R. S., &c. the Commander of H. M. S. Pheasant, in the voyage during which the plant was collected. It is very distinct from *C. tridentatum* of Dr. Hooker, (Exotic Flora, tab. 90,) but the distinction between it and the *C. floribundum* of the same work, (tab. 151,) does not appear to extend much beyond the differences in their colour.

XXIV. Polystachya puberula. *Lindley.*

An exceedingly rare species of Polystachya, sent from Sierra Leone, by Mr. George Don, in 1822. The leaves are five or six upon each of the ovate bulbs, distichous, lanceolate, obtuse, with about nine nerves, and forming a sort of stem by the union of their bases. The flowers are terminal, bright greenish-orange, in a close thyrsoid panicle, and covered over with minute yellow hairs. From the other species of Polystachya it is easily distinguished by its long

pale yellow leaves, by the compact nature of the panicle, and especially by the downy covering of the flowers. A very delicate stove plant, propagated with difficulty by dividing its roots. It is figured in the Botanical Register, tab. 851.

XXV. Vanda multiflora. *Lindley.*

This is a fine species of Orchideous plant, frequently imported from China, and known for several years in collections; but it has rarely produced its flowers. Its leaves are large, thick, and dull green, placed in two rows, a little twisted in their length, and rounded obliquely, with a little notch at the ends. The flowers are bright, and dark yellow, beautifully variegated with purplish brown marks. They appear in close, erect, rigid, axillary spikes, and remain expanded for a long time. It is distinguished from *V. præmorsa,* the *Cymbidium præmorsum* of Willdenow, by its long spikes of flowers, large size, and differently terminated leaves. A hardy stove plant, flowering in June, easily cultivated in decayed vegetable soil. Figured in Collectanea Botanica, tab. 38.

XXVI. Camaridium ochroleucum. *Lindley.*

A parasitical plant, with the habit, axillary bulbs, and long pale green leaves of *Ornithidium coccineum.* The bulbs are ovate, two-edged, and rugose. Stems decumbent, two-edged, covered over with the withered remains of the bases of the leaves. Leaves long, ligulate, somewhat wavy, equally emarginate at their ends. Flowers are pale yellow, or nearly white, spreading open, solitary, appearing out of a spathaceous peduncle, from the lower axilla of the leaves. The lip is darker yellow than the sepals, trifid, cucullate,

and much shorter than the exterior sepals. This plant was sent to the Society from Trinidad, by His Excellency Sir RALPH WOODFORD, and is figured in the Botanical Register, tab. 844. It flowers in June, and appears at present to be more difficult to manage than most plants of its kindred.*

XXVII. Cattleya Forbesii. *Lindley.*

This is at once an elegant and interesting addition to the genus Cattleya; from the former species of which it is distinguishable by the yellow colour of its flowers. It is a parasitical plant, not producing above-ground bulbs, but from a tortuous entangled prostrate caudex, throwing up a few round stems about six inches high, and covered with greenish white vaginæ. On each stem are formed two oval lanceolate leaves, which are obtuse, with a little point at the ends. The flowers are large, appearing in pairs, of a dull dirty yellow colour, their segments spread open, obovate, lanceolate, and wavy. The labellum is wrapped round the columna; on the outside it is whitish, inside bright yellow, beautifully marked with crimson dots; the middle lobe is cordate, roundish, crisp, with a little bag at the very tip. Sent by Mr. FORBES, in 1823, from Rio de Janeiro, where it appears to be common in some situations, growing and flowering in profusion on the trunks of dead trees. In this country it blossoms in June.†

* Surely the *Dendrobium album* of Dr. HOOKER's Exotic Flora, Vol. ii. tab. 142, is not different from this.

† This is now figured in the Botanical Register, tab. 953, from the Society's plant.

XXVIII. Aeranthes grandiflora. *Lindley.*

This most singular plant was sent by Mr. Forbes in 1824, from St. Mary's, Madagascar. It is a low parasitical plant, without either stem or bulbs, but throwing out from the base of its leaves a few slender roots, by which it adheres to the soil, or surface of the material on which it grows. Its leaves are in two ranks, four or six in number, glaucous blue, and waved at the edge. The flower is large and nearly transparent, of a pale greenish yellow colour. It appears at the end of a weak radical scape, covered closely with hard, dry, striated sheaths, and unless supported artificially, falls prostrate upon the earth. The figure in the Botanical Register, tab. 817, represents the flower as too green. It was made from the first that appeared, but which did not entirely expand. Afterwards, from the same scape, and nearly from the same spot, other flowers were produced in succession—a singular circumstance, which is common to many other plants of the same family, from the same country. A delicate stove plant, flowering in May.

XXIX. Ionopsis utricularioides. *Lindley.*

Dendrobium utricularioides Swartz.

Some delicate individuals of a parasitical stemless orchideous plant, with purplish green leaves, sent from Trinidad to the Society, by His Excellency Sir Ralph Woodford, in 1823, flowered among decayed earth in the month of April of the last year. They proved to belong to the *Dendrobium utricularioides* of Swartz, a species found by that Botanist in the Island of Jamaica. The flowers are in a branched terminal spike, and of a delicate white, tinged at the edges with

lilac. All the segments of the flower are parallel with each other and connivent, while the lip of the labellum, which is closely supported beneath by the two lower segments, and is large and hanging down, gives the flower the appearance of some kind of Utricularia. The plant is undoubtedly referable to M. Kunth's genus *Ionopsis,* but seems different from the *Iantha pallidiflora,* figured by Dr. Hooker, in Exotic Flora, tab. 113. A figure taken from the plant in the Garden of the Society, may be found in Collectanea Botanica, tab. 39.

BULBOUS PLANTS.

XXX. Conanthera campanulata.

Conanthera bifolia, Sims; *not of* Flora Peruviana.

Roots of this extremely rare plant were received from Mr. Place, as part of his collection of Chilian plants, transmitted to England, by Mr. John Miers. It is quite different from *C. bifolia,* with which it has been confounded by Dr. Sims. It is a small bulbous-rooted plant, producing about three linear-lanceolate leaves, which spread nearly flat upon the ground. The flowers appear in an umbel, seated upon a nearly erect scape, and expand two or three at a time. They are bright blue, and somewhat flatly campanulate; their outer segments are concave, and rounded, their inner flatter, smaller, and fringed as in Thysanotus, but never either acute, reflexed, or spotted. A figure of the true Conanthera bifolia may be found in the Botanical Cabinet, tab. 904; and of *C. campanulata,* in the Botanical Magazine, tab. 2496, under the erroneous name of *C. bifolia.* It is a very delicate greenhouse plant, which has not yet produced either seeds or

offsets. It flowers in May, and may be thus distinguished from *C. bifolia.*

C. campanulata, foliis lineari-lanceolatis humifusis, perianthii laciniis obtusis patentibus immaculatis: alternis minoribus fimbriatis.

XXXI. Zephyranthes rosea. *Lindley.*

A species very like *Zephyranthes Atamasco,* in foliage, which is however broader, and lies closer to the ground. The flowers are of a beautiful rose colour, more vertical, and of a firmer texture than in *Z. Atamasco.* It was brought from the Havannah, in 1823, by Mr. George Don, and has been figured in the Botanical Register, tab. 821. When first brought to this country it manifested no signs of flowering, but in the second season of its cultivation it produced its blossoms in great abundance.—A green-house plant, flowering in May, propagated freely by divisions of the roots.

XXXII. Crinum revolutum.

A bulb of a species of Crinum was brought from Maranham, to the Society, by Mr. George Don, in 1823. It appears to be as distinct from the other species of Crinum already described by authors, as they are from each other. The leaves are a foot and an half long, linear-lanceolate, flat, with two nerves towards the end, blunt, recurved, with a few scattered glands at the edge, rather longer than the scape, and bright green. The flowers appear in fours, they are white with a tinge of pink, and have an unpleasant smell. Their stalk is short, the tube is green, round, six inches long, becoming white, and narrower towards the upper

extremity; their segments are linear, a little curled at the edge, at first rolled back, afterwards hanging down. The filaments and style are red at the ends. This species seems to be nearest in natural affinity to *Crinum Americanum*, but that plant has broader leaves, a shorter tube, sessile flowers, with lanceolate, much more undulated segments. From that species it may be distinguished by the following character:

C. revolutum; sesquipedale, foliis patentibus lineari-lanceolatis obtusis margine scabriusculis, scapo foliis subæquali, umbella 4-flora, perianthii laciniis linearibus revolutis denique pendulis, filamentis styloque apice coloratis.

A stove plant, flowering in May, and slowly increased by offsets.

XXXIII. Amaryllis Forbesii. β, *purpurea.*

In the Report of last year, this new species of *Amaryllis* was described; since that Report was prepared, a variety flowered, which far exceeded in the beauty of its blossoms the first which was seen. The whole of the colour, which in the original variety is of a delicate pink, was in this changed to a rich purplish crimson, resembling the colour of *Crinum amabile.* A smaller number of flowers was produced in this new variety, and the divisions of the flower appeared more revolute than in the kind first seen; otherwise they were not observed to differ.

XXXIV. Chrysiphiala pauciflora. *Lindley.*

Two or three roots of this plant were sent to the Society in 1823, from Peru, by the late James Cowan, Esq. and flowered in the green-house in April. It is a low bulbous-rooted plant,

producing its flowers before the leaves. The flowers are of an orange-yellow, with green tips to their segments, and are seated in pairs upon a scape, a little more than three inches long. The leaves are nearly erect, lanceolate, petiolate, quite smooth, fleshy, slightly plaited, dark green above, beneath somewhat glaucous, with the midrib incomplete, on the upper side depressed in the middle, on the under side very prominent. A figure of it has been given from a plant in the Society's Garden, in the Exotic Flora, tab. 132.

HARDY PLANTS.

Trees or Shrubs.

It may be here stated that in future years this head of the Report may be expected to be much more ample than it has been hitherto; young plants of this description do not come into flower so early as those which are of an herbaceous nature.

XXXV. Rosa Indica var. *ochroleuca.*

This plant was brought for the Society from China, in 1824, by Mr. Parks, as one of the interesting yellow China Roses, which have long been known to collectors by the drawings of the Chinese; but upon flowering it proved to be neither *R. pseud-indica,* nor *R. xanthina,* but a variety of *Rosa indica,* with pale sulphur-coloured flowers.

It is a plant with a less vigorous habit than the common *R. indica,* resembling in that respect, *R. i. odoratissima.* The branches when young are covered with many small glands; leaves smooth, of a thin texture, and not shining,

leaflets rather convex, and by no means veiny; leaf-stalks covered with glands, among which a few little hooked prickles are intermixed. The flower-stalk is glandular, tube of the calyx campanulate, and nearly smooth, sepals reflexed, quite simple, villous, and glandular at the edge. The flowers are very large, solitary, pale sulphur colour, quite double, very fragrant, not expanding much more than *R. sulphurea;* but under the influence of much heat, opening fully, when they measure four inches across. This is one of the finest varieties of China Roses known in the gardens, and so entirely different from any other, that it may be considered an important addition to our collections. It appears to be hardy, but thrives in a conservatory, where it expands its flowers better than in the open air.

XXXVI. Rosa gemella. *Willdenow.*

A plant of a Rose from North America was purchased by Mr. Sabine some years since from Mr. John Frazer, under the name of *Rosa setigera,* of Michaux; and subsequently presented by him to the Society. It is a low bush, closely covered with dull-green, scarcely shining leaves, which are quite smooth above, and are hairy on the midribs beneath, and on the leaf-stalks. The stem bears under each leaf two slender falcate prickles, and on the stronger root-shoots at the base, are several weak, straight, unequal prickles; the stipules are convolute, as in *Rosa Carolina;* the flowers bright red, surrounded by longer leaves; the flower-stalks are smooth; tube of the calyx short, ovate, and with the quite simple sepals, glandular. This is plainly different from the obscure species under the name of which it was sold, but I have no

doubt that it is the *R. gemella* of Willdenow, with whose description of that species it agrees in all essential particulars, especially in being as it were intermediate between *R. lucida* and *Carolina,* and in its leaves not being at all shining.

Thus this little known and long lost plant may be considered restored to our gardens.*

XXXVII. Menziesia polifolia. *Swartz.*

Several distinct varieties of this beautiful little shrub are cultivated in gardens, but have not been distinguished in any work of authority. As they have all flowered except one, in the Garden, in the course of the summer, they are here described and distinguished.

That which appears to be the wild form of the plant, has a diffuse, branched stem, ovate stalked flat leaves, rough, with scattered glandular hairs on the upper side, and inflated exactly oval flowers of a bluish purple colour. This was presented to the Society by Mr. William Malcolm, and may be called *M. polifolia vera.*

The second variety, which was presented to the Society by Mr. William Falla, of Gateshead Nursery, Newcastle-upon-Tyne, is remarkable for the rich dark colour of its flowers, for which reason it may be called *M. polifolia atropurpurea.* Its stem is upright; leaves ovate, stalked, slightly revolute at the edge, and rough with scattered glandular hairs on the upper surface. The flowers are ovate, retuse at the base, and of a very dark purple.

* M. Seringe, in M. De Candolle's Prodromus, Vol. ii. p. 605, upon the authority of a specimen from Dr. Meyer, refers R. gemella to R. cinnamomea, distinguishing it only as a variety of that species. But if R. gemella is to be reduced to the station of a variety only, it would be better placed under R. Carolina.

The third variety, which deserves to be distinguished, was received from Messrs. Loddiges, under the name of *M. polifolia stricta,* but that name not appearing sufficiently appropriate, it would be better to call it *M. polifolia longifolia.* The stems are nearly upright. The leaves narrow, ovate, lanceolate, stalked, spreading, somewhat falcate, much revolute at the edge, and rough, with scattered glandular hairs on the upper side. The flowers are inflated, ovate, pale bluish purple.

Resembling the last, but differing from it in the deep colour of the flowers, and in the unusual breadth of the leaves, is a plant called by Messrs. Loddiges *M. polifolia latifolia,* and by them presented to the Society. It has a nearly erect stem; leaves broad, ovate-lanceolate, stalked, spreading, convex, but scarcely revolute at the edge, and nearly destitute of hairs on the upper side. The flowers are very large, of a deep rich purplish red.

The last variety to which it is necessary to advert, is, that remarkable plant which is occasionally seen in nurseries under the name of *M. polifolia nana.* It is said to have been first observed many years ago in Mr. Malcolm's Nursery at Kensington, in a bed of seedlings of *M. polifolia.* It forms a very compact dwarf bush, appearing as if intermediate between *M. cærulea* and *M. polifolia*: it is thickly covered over with small ovate stalked leaves, a little revolute at the edge, slightly hairy above, and quite hoary on the under side; all of them many times longer than the interval between them. The stem is slightly downy, but quite destitute of the long spreading glandular hairs by which the other varieties of *M. polifolia* are distinguished. The flowers not having been observed,

the place of this kind cannot be decided with certainty, but it is probably a species distinct from *M. polifolia*, from which there is an abundance of characters to separate it. But without seeing its flowers, it is better to allow it to remain provisionally with the species to which it has hitherto been referred. For the plants in the Garden the Society is indebted to His Grace the Duke of BEDFORD.

ANNUAL PLANTS.

XXXVIII. Castilleja septentrionalis. *Lindley.*

A single individual of this exceedingly rare plant, which has been called *Bartsia pallida* by American botanists, sprang up among the earth of some turfs containing plants which had been sent to the Society through the hands of EDWARD MOORE, Esq. from Labrador in 1823, by the Missionaries stationed there. It was about a foot high, with narrow, lanceolate, scattered, smooth, sessile, spreading, three-nerved, dark green leaves, tinged with red. The flowers were in a pale yellowish-green imbricated spike. The bracteæ large, oblong, somewhat truncate, five-toothed at end, of a pale yellowish green, slightly tinged with red, and with three prominent veins. The calyx was hairy. Corolla bright green, and shorter than the bracteæ, its lower lip very small, somewhat inflated, and trifid. Anthers discharged an orange-coloured pollen from just under the end of the upper lip of the corolla. Stigma bright green, capitate, two-lobed, longer than the anthers. From a careful inspection of the flowers of this plant, I do not doubt that it is, as M. KUNTH has observed, referable to the genus Castilleja; but it is singular that Mr. NUTTALL should have retained it under Bartsia, notwithstanding his having separated *Bartsia coccinea*

as a particular genus, which he calls *Euchroma*, and which does not differ from Castilleja. The specific name of *pallida* has not been retained for this plant, because the Siberian plant, which Linnæus seems to have had in view for his Bartsia pallida, is quite distinct as a species from the American plant. This is figured from the Garden of the Society in the Botanical Register, tab. 925.

XXXIX. Talinum ciliatum. *Flora Peruviana.*

A beautiful hardy annual plant, well adapted to covering rock-work, which it enlivens with the brilliant lustre of its purple blossoms, reposing upon the pure glossy green of the leaves. It is a dwarf, rather succulent plant, with long, narrow, bluish green leaves, beginning to flower in June, and remaining till the first frosts of autumn. The seeds should be sown on a hot-bed, from whence the plants may be afterwards removed to the place they are to occupy during the summer. A native of Chile, whence seeds were received by Mr. Place, and by him presented to the Society. There is a figure in Dr. Hooker's Exotic Flora, tab. 82.

XL. Vicia atropurpurea. *Desfontaines.*

A beautiful annual plant, native of the states of Barbary. The stem is weak, and procumbent, unless supported upon treillage, or by a stake. The leaves are pinnated and hairy, and their stalk is terminated by a three-parted tendril. The flowers are of a rich and beautiful purple, appearing in long one-sided racemes, opening in the middle of July, and remaining in beauty for many weeks. The plants were raised from seeds sent to the Society by Mr. Otto, from the Royal

Botanic Garden at Berlin, as well as by Mr. Fischer, Director of the Botanic Garden at Gottingen. A figure from plants growing in the Garden of the Society has been published in the Botanical Register, tab. 871. The plant should be raised from seeds, and treated as an hardy annual.

BULBOUS PLANTS.

XLI. Amaryllis longifolia, *fl. albo.*

A pretty variety of Amaryllis longifolia, received from Mr. C. Van Eeden, of Haarlem. It is not to be distinguished, specifically, from the species to which it is here referred, although it appears more robust, and produces both its flowers and seeds in great abundance. The flowers are quite white, and similar in shape to those of *Crinum aquaticum,* figured in the Botanical Magazine, tab. 2352. It appears to be hardy enough to live through the winter, in a warm sheltered border, without protection.

XLII. Tritonia lineata. *Ker.*

Gladiolus lineatus. Salisbury.

This plant blossomed freely in the open air, under a south wall. It has survived two winters, and is now (June, 1825) in perfect beauty. It is a middle sized border flower, with leaves like those of a Gladiolus, and pale yellow flowers, elegantly streaked with brown lines. A native of the Cape of Good Hope, whence roots were sent to the Society by M. Villet. A figure of the plant may be found in the Botanical Magazine, tab. 487, under the name of *Gladiolus lineatus.*

HERBACEOUS PLANTS.

XLIII. Œnothera speciosa. *Nuttall.*

A handsome perennial plant, lately discovered in the Arkansa country, in North America. As a border plant it is recommended by the beauty and long succession of its flowers, but its creeping roots, which over-run the neighbourhood of the spot where it is planted, render it objectionable. Its stem is downy, about two feet high, covered with glaucous, cut, lyrate leaves. The flowers are large, white, very handsome, becoming pink upon closing. The anthers and stigma are pale yellow, the latter four-lobed, a little dashed with red. The capsule is erect, short, rounded, truncate, with eight prominent ribs, which are alternately narrower. Roots were brought to the Society from North America, by Mr. David Douglas, in 1824. It is figured in Dr. Hooker's Exotic Flora, tab. 80, and is propagated with facility by divisions of the roots.

XLIV. Œnothera triloba. *Nuttall.*

Seeds of this interesting species of Œnothera were brought from North America by Mr. David Douglas, in the spring of 1824. It is a stemless spreading annual plant, with closely tufted bright green leaves, which are deeply lyrate, and quite smooth. The flowers are bright yellow, seated among the leaves, and expanding in the evening only. Stigma four-lobed; capsules smooth, sessile, very short, with four triangular angles, and four horns at the end between the angles. The species has much resemblance to the *Œnothera acaulis*, noticed in the Report of last year, but is distinguished from it

by the smoothness of its leaves, its yellow flowers, form of capsule, and other obvious marks. Mr. Nuttall discovered it in the neighbourhood of the Red River, in the Arkansa Country of North America, and from a plant communicated by him to Robert Barclay, Esq. a figure in the Botanical Magazine, tab. 2566, has been taken.

XLV. Pogonia pendula. *Lindley.*

Triphora pendula. Nuttall.

This most curious little plant blossomed in great perfection in a shady American border, on the 31st of July. The roots had been collected in Canada by Mr. David Douglas, and brought home by him in 1824. The whole plant is not more than four inches in height, and has no other than about three little scale-like, three-nerved leaves, which appear upon the simple red stems. The flowers are terminal, white, tinged with red, large for the size of the plant, appearing about three together, and opening in succession. The face of the labellum is green, the anthers and pollen masses purple. It is probable that this plant is lost to the Garden, as it has not made its appearance this year (1825), but if it should not be lost, it can scarcely be anticipated that any means will be discovered of increasing it.

XLVI. Mimulus parviflorus. *Lindley.*

A pretty prostrate perennial plant, with trailing hairy stems, putting forth roots at every joint Leaves ovate, toothed, and three-nerved; flower-stalks capillary, and covered, as well as the calyx, with minute glands. The flowers are small,

bright yellow, spotted with crimson in the throat. This is an interesting species, raised from seeds collected in Chile, and presented to the Society by Mr. PLACE. It is covered with flowers through nearly the whole year, even during the winter months, if protected by a hand-glass. A figure from a plant in the Garden of the Society has been published in the Botanical Register, tab. 874. This plant is readily increased by seeds, which it produces in abundance, or by divisions of the rooting stems.

XLVII. Arum crinitum. *Linnæus.*

Roots of this extraordinary plant were sent to the Society from the south of France, by GEORGE BENTHAM, Esq. of Montpellier, in 1823, and blossomed in a warm border in May. The plant is exceedingly rare, and its flowers are seldom seen. They consist of a large brownish-purple spatha, covered closely in the inside by reflexed, fleshy, dull purple hairs, which are very dense at the orifice of the tube, where they are said to act as a means of preventing the return of such insects as find their way into the tube. In decay, the flower is said to exhale a powerful smell of carrion, but this was not the case in the plant which flowered in the garden. The plant in the Society's possession has not yet increased. A figure from it has been published in the Botanical Register, tab. 831.

XLVIII. Pedicularis Canadensis. *Linnæus.*

A pretty plant seldom seen in collections, on account of the difficulty of cultivating it. That which flowered in the garden was brought from North America by Mr. DAVID

Douglas, in 1824. Its dark green, elegantly divided leaves, and heads of pale yellow flowers tinged with red, and appearing in the first days of April, render it a beautiful ornament to the flower garden. It is figured in the Botanical Magazine, tab. 2506, from a plant in the possession of the Society.

XLIX. Dracocephalum nutans. *Linnæus.*

This, although an old Linnean plant, and introduced so long since as the early part of the last century, is seldom seen in gardens. It is a beautiful perennial, expanding its blossoms in the last days of April, and continuing in beauty till the end of August. The stem is square, from nine inches to a foot in height; the angles rough with reflexed hairs. Leaves oblong o robovate, obtuse, stalked, wavy, three-nerved. Flowers bright dark blue in many-flowered whorls. Seeds, collected among the Mountains of Altai, were sent to the Society by Dr. Fisher, in 1823. A figure of it is in the Botanical Register, tab. 841.

L. Nolana paradoxa. *Lindley.*

This is a very valuable introduction to our gardens, for which we have again to thank Mr. Place, to whom it was sent from Chile, by Mr. Miers. It may be either treated as a tender annual, being raised in the spring in an hot-bed, and planted in the open border in June, or as a frame perennial, taking the plants out of the border in the autumn, potting them, and keeping them in a cold frame over the winter; they may be replanted in May, and the trouble of sowing the seeds avoided. The leaves are small, fleshy, ovate and stalked. The flowers of a bright and clear violet, with a

white centre, very handsome, and continuing to expand in the utmost profusion during all the summer months. With much of the habit of the common *Nolana prostrata,* this is a far more beautiful plant. It is figured froma plant in the Garden of the Society, in the Botanical Register, tab. 865. The *Nolana paradoxa* of the Botanical Magazine, tab. 2604, is another and very different species.

LI. Sambucus Chinensis.

Plants of a species of Elder were imported by the Society in 1822, from China, among the earth in which other things had been placed. From that time up to the present period, they have remained exposed to the weather without protection, and without injury. In September last, they produced their flowers for the first time. The species is a rank, weedy, herbaceous plant, in a favourable situation forming a bush five or six feet high, with the aspect of *Sambucus Ebulus.* The branches are round, pale green, with rough, dark green furrows. The leaves are pinnated of three or four pairs, and an odd one; leaflets oblong, lanceolate, concave, serrated, very dark green above. The flowers are in terminal cymes, and of two sexes. The males are white and numerous, with brownish purple anthers, the females fewer in number, and mixed irregularly among the males; they are destitute of either calyx or corolla, and consist of a large cyathiform, fleshy discus, in the centre of which the style is immersed. Fruit has not been produced in this country. Propagated by pieces of the roots, which over-run the border, and require to be annually reduced. The species may be thus characterized.

S. Chinensis; herbacea, caule verrucoso striato, foliolis lanceolatis crenato-serratis utrinque nudis, floribus fœmineis apetalis cyathiformibus carnosis.

LII. Leonurus lacerus.

This species of Leonurus was raised in the Garden of the Society from seeds sent from Nepal, by Dr. Wallich, and flowered for the first time in August, 1824. It is a hardy herbaceous plant, most nearly resembling *L. crispus* on the one hand, and the plant called in gardens *L. condensatus* on the other. Its leaves are always curled in such a way as to have a considerable portion of their lower side exposed; the lower are roundish, cordate, and five-lobed, with acutely-cut, irregularly-lacerated segments; the upper gradually lose their cordate form, and become, towards the top of the stem, ovate, with a few acuminate divisions on each side. The flowers are pale purple, woolly, and in size and form like those of *Leonurus Tataricus.* This species may be thus distinguished:

L. lacerus; foliis complicatis inciso-serratis: laciniis acuminatis; inferioribus rotundato-cordatis superioribus ovato-lanceolatis rhomboideis, corollis calyce pungente longioribus.

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XXV. *Observations on a Disease to which* Grapes *are liable, and on the Means of preventing it. By Mr.* Daniel Judd, *F. H. S.*

Read November 16, 1824.

There is a disease to which Grapes grown under glass are liable, which though so destructive, that when it does take place it generally ruins the crop, yet I have never met with any observations upon it, or directions how to prevent it.

It is well known that after the berries are formed upon the bunch, they advance pretty rapidly in size until the period when the seeds are forming, when for a time their increase seems suspended. Immediately after this it sometimes happens that the foot-stalks suddenly turn brown and shrink, and the berries ceasing to increase in size, shrivel, acquire an unpleasant taste, and ultimately fall off. By many gardeners this disease is attributed to the badness of the border on which the Vines are planted, but it will be found that it arises from a totally different cause.

At the formation of the seeds, the skins of the berries as well as of the foot-stalks are remarkably tender, and consequently easily affected by the surrounding atmosphere. If fresh air is not given early in the morning, before the internal air becomes heated, a vapour rises in the house which is perceptible by its condensing on the glass and walls, and on any iron-work that may be in the house. If under these circumstances the bunches of fruit are carefully examined, the

moisture will be found plentifully collected on the berries, and more particularly on the foot-stalks. This is the destructive material, for as the temperature of the house is increased, an effect equal to scalding is produced on the cuticle of the berries, and hence the diseased appearance which they assume, and should the sun break suddenly out the destruction becomes complete.

To prevent this, one or two of the top sashes should be drawn down a little, early in the morning, and if the day opens out bright and sunny, the rest of them may also be drawn down. Unless the day be very warm the front lights should not be opened, for a current of air is produced by this, which in cold weather is very liable to produce a spotting upon the berries, a disease scarcely less injurious than the scalding. This however does not prevent the berries from colouring, but if the spots become large, the berries take an irregular shape, and cease to improve in size. The first appearance of this disorder is a number of very minute brown spots, which penetrate quite through the skin, sometimes affecting some of the berries only, sometimes the whole bunch.

XXVI. *Description of the different Varieties of* Parsneps, *cultivated in the Garden of the Horticultural Society of London. By Mr.* ANDREW MATHEWS, *A. L. S.*

Read December 6, 1825.

THE cultivated Parsneps are varieties of the *Pastinaca sativa*,* a native of England and other parts of Europe. The wild plant differs from the cultivated ones in having a smaller root, and in its leaves being downy underneath. The garden Parsnep has been long used as a culinary vegetable, as well as for the purposes of agriculture. As an esculent it is sufficiently known and esteemed, but until lately, there has, I believe, been but one kind in general cultivation in this country. The following descriptions of the different varieties at present grown in the Garden of the Horticultural Society will therefore probably not be unacceptable.

Dr. JOHN M'CULLOCH is, I believe, the first writer who has noticed more than one kind. In his Paper on the cultivation of Parsneps, addressed† to the Caledonian Horticultural Society, he mentions three kinds, viz. the *Coquine*, the *Lisbonaise* and the *Fourquée*, as being known in the Islands of Guernsey and Jersey. Mr. NEILL, the Secretary of the Caledonian Horticultural Society, in his Treatise on Gardening, published in the Edinburgh Encyclopædia, mentions

* English Botany, folio 556; and SMITH's English Flora, Vol. ii. page 101.

† Transactions of the Caledonian Horticultural Society, Vol. i. page 405.

the *Siam* Parsnep, as described by French writers; but he does not quote any authority for the statement, and I have in vain endeavoured to find a description of it in the Bon Jardinier, or any other modern French book on Gardening. Mr. Neill states that it is yellow, and more tender, with a richer taste, than the Common Parsnep, from whence I am inclined to think it may be the same as I have described below, as the Turnep-rooted Parsnep. Dr. M'Culloch considers the *Fourquée* to be merely a modification of the *Lisbonaise*, and though it is in cultivation in Guernsey, it is less esteemed there.

Having made these preliminary observations, I now proceed to describe the varieties with which I am acquainted.

1. Common Parsnep.

Synonyms.

Swelling Parsnep.

Large Swelling Parsnep.

The leaves of this kind are strong and numerous, generally about two feet high; the roots are from twenty to thirty inches in length, and from three to four inches in diameter at the shoulder, regularly tapering to the end, occasionally producing a few strong fangs; the crown is short and narrow, elevated and contracting gradually from the shoulder, which is generally below the surface of the earth. Seeds with the above names were received from different Seedsmen in this country, from Holland, from Germany, and from America, and all proved alike, though some were much superior to others in the size of their roots, owing, I consider, to the judgment with which the plants, from which the seeds saved

were selected, as well as the age of the seeds. It was found that new seeds uniformly produced the largest roots.

2. Guernsey Parsnep.

Panais long, of the French.

Panais Coquine, of Guernsey.

The leaves of this kind grow much stronger, and somewhat taller, than those of the Common Parsnep, the leaflets are also broader; the only difference I have been able to distinguish in the roots is, that those of the Guernsey Parsnep are the largest and most perfect, being sometimes three feet long. Those produced from seeds obtained from Guernsey were evidently much superior to what were raised from seeds saved in this country in the preceding year; from which circumstance I am inclined to think the Guernsey Parsnep is only a superior variety of the Common, arising from soil and cultivation in that Island. Dr. M'Culloch states that in Guernsey, its roots grow to the length of four feet. The Society was indebted to Major-General Le Couteur, of Jersey, for the first seeds received of this kind; last year they were also sent by Mr. William Rogers, of Southampton. In its flavour it does not differ from the Common Parsnep.

3. Hollow-crowned Parsnep.

Hollow-headed Parsnep.

Panais Lisbonaise, of Guernsey.

In this variety the leaves are shorter and not so numerous as those of the Common Parsnep, the roots are oblong, about eighteen inches long, more swollen at the top, and not

tapering gradually, but ending somewhat abruptly with a small tap-root, which is about four inches in diameter at the shoulder; the crown is short and quite sunk into the shoulder, so as to form a hollow ring round the insertion of the foot-stalks, and grows mostly below the surface of the soil. Dr. M'CULLOCH appears to have first described this Parsnep; seeds of it, with the English names above given, were received from English seedsmen; but the description of the *Lisbonaise* accords so exactly with the Hollow-crowned Parsnep grown in the Garden of the Society, as leaves no doubt, in my opinion, as to their identity. This variety possesses sufficient merit to recommend it for general cultivation, especially as it does not require so deep a soil as either of the preceding; in flavour it does not differ from them.

4. Turnep-rooted Parsnep.

Panais rond.

Siam Parsnep? Neill.

The leaves of this sort are few, and do not exceed twelve to sixteen inches in length; the roots are from four to six inches in diameter, funnel-shaped, tapering very abruptly with a strong tap-root, the whole being from twelve to fifteen inches in length; the rind is rougher than either of the preceding; the shoulder very broad, growing above the surface of the soil, convex, with a small short crown. It is much the earliest of the kinds, and if left in the ground too long is apt to rot in the crown; the leaves also decay much earlier than in either of the preceding, This variety has been recently introduced by the Horticultural Society from France, the

seeds having been received from M. Vilmorin, in 1822. I am not aware that it was known in this country before that period. It is stated, in the Bon Jardinier* for that year, to be a new variety, but there is not any account of its origin in that work. It is particularly well adapted for shallow soils, and from its coming into use much earlier than either of the other varieties. In flavour it is much superior, and when dressed is of a yellower colour than any of the others.

* See Bon Jardinier, for 1822, page 228 and 277.

XXVII. *On the Cultivation of* Ginger *in a Glazed Pit. By Mr.* Christie Duff, *Gardener to the Earl of* Grosvenor, *at Eaton Hall, Cheshire.*

Read January 17, 1826.

Fresh roots of Ginger are much in request in many families for preserving, but the usual method of growing them in pots or boxes in a stove, affords but a scanty supply. It occurred to me, that by giving the roots greater space, and growing the plants in a moister heat, the produce would be greater, and the roots more tender. I first put the following plan in practice in 1819, at Bretton Hall, in Yorkshire, where I then lived as Gardener to Colonel Beaumont, and I continued to use it until I left that place last year.

In March I took some old roots and divided them, leaving one eye to each piece. These pieces I potted separately in small pots (sixty size), and placed them under a frame in a hot-bed. When they had shot from a foot to eighteen inches, which was about the middle of May, I turned out the plants, under glass, into a sunk brick pit, which had been built to protect hardy green-house plants in winter, about one foot from each other in a light rich soil, the surface of which was three feet from the glass, in order to leave room for the plants to grow. The bed under the mould was made up of a mixture of stable-dung and oak leaves, the heat produced from which supplied warmth sufficient for the plants, exclusive of what was afforded by the sun. The soil in the bed did not

exceed six inches in depth. The plants were kept without air, that is, the lights were not left open at all. In hot weather, water was given to the plants daily.

Under the above treatment, the Ginger grew rapidly, and in September was taken up for use; and I have frequently obtained separate roots which weighed five ounces each. After September the plants, if left in the ground, begin to decline, and the roots at that time, and under these circumstances, become stringy.

XXVIII. *Observations upon the natural Laws which govern the Production of Double Flowers, arising out of a remarkable Case of Præternatural Formation in the Flowers of an* Amaryllis. *By Mr.* John Lindley, *F.L.S., &c. &c. Assistant Secretary for the Garden.*

Read December 6, 1825.

In September last, some dried roots of a plant called the Double Barbadoes Lily were, with several other things, sent to the Horticultural Society by Mr. John Herbert, Superintendent of the Botanic Garden St. Vincent's, by the desire of His Excellency Sir Charles Brisbane, the Governor of that Island. Upon blossoming last month in the stove, the Lily proved to be a variety of *Amaryllis crocata,* in which so considerable an alteration of the parts of fructification had taken place, as to produce a very handsome double flower. It is not however for the purpose of bringing into notice this particular variety, which has not now been introduced for the first time, that I submit the following observations, but for the sake of recording one of the most singular instances of præternatural formation with which I am acquainted in the vegetable kingdom, and which appears to me to confirm an opinion I have for some time entertained, respecting the laws which regulate the production of double flowers.

It is well known that the cause of that kind of monstrosity which is commonly called a double flower, is either the mul-

tiplication or the transformation of the various organs which envelope the ovarium, or even of the ovarium itself; but I am not aware that it has been shewn that actual changes of structure are subject to the influence of certain fixed laws, from which it rarely happens that any considerable deviation takes place. It has indeed been stated by Sir JAMES EDWARD SMITH,* that the change of form in the various parts of a flower takes place backwards, but the question has been so cursorily treated in the work referred to, that I am induced to make some additional remarks upon the subject.

It is well understood that the universal principle upon which perfect vegetables are formed, is by the continual addition of parts one above the other, round a common axis which is produced by their accretion. This law is not confined to the production of foliage or branches only, but must be considered to extend to the ultimate point of vegetable developement in the ovarium; and seems to indicate that the progress of nature is continually onwards. Unless, therefore, it could be shewn that the order of alteration in the structure of organs so produced is in monstrous formations reversed, it would be a reasonable inference that nature follows her usual course in transformation, as well as in original production, and that the changes which particular portions of a flower may undergo, always have the character of that series which is placed next them in the inside, and not of that on the outside. The consequence of the prevalence of such a law would therefore be this with respect to the formation of double flowers, that bracteæ, if present, would change into

* Introduction to Botany, Edit. 5, page 220.

calyx, calyx into petals, petals into stamens, and stamens into ovaries; and that the reverse of that order could not take place. Alterations indeed of another kind may happen, such as changes in the appearance of stamens, occasioned by abortion; but such metamorphoses are to be considered imperfect attempts on the part of particular organs to revert to their primitive forms, and are analogous to the alterations of the ovarium, which I shall have presently occasion to notice, but they do not affect the present question, which concerns only the law of transformation of one organ into another organ.

I am not ignorant that the common belief upon this subject may be against the opinion I venture to entertain; I am aware that the usual explanation of the cause of the monstrous multiplication of the parts of a flower is the conversion of stamens into petals, and that, as I have already stated, a Botanist of high consideration has recently expressed his opinion, that such changes take place backwards, or in an inverse order to that of first developement. But, if the common explanation were admitted with respect to these alterations, it would not be easy to shew the cause of the greater beauty of double than of single flowers, because the inevitable consequence of a reversed order of transformation would be, that the rich or delicate colour of the petals, upon which all flowers depend for their beauty, would be converted into the uniform green of the calyx. Such a change, therefore, instead of producing a flower more beautiful than its original, would tend to destroy its beauty.

But if the true order of alteration be such as I have described, if it takes place upwards, or, speaking more plainly,

from the circumference to the centre, and if the different organs of fructification are only susceptible of being converted into those which are next between them and the axis of inflorescence, and if no retrograde action takes place, the reason of the superior beauty of double flowers will be obvious. In the latter case, the calyx may indeed throw off its dull green colour, and assume the vivid hues of the petals, as in the Pæony and Primrose, and the petals may dilate themselves, and in attempting to perform the functions of stamens may multiply and transform themselves in the transition into an hundred curious and grotesque appearances; but no diminution of beauty, or loss of brilliant colours will take place. It would also, I think, be reasonable to conclude, in the absence of more satisfactory evidence, that a given organ would in its transformation bear a more perceptible resemblance to that from which it was changed, than to that towards which its form was altering. Now it is obvious to every observer, that in double flowers the metamorphosis which takes place between the petals and stamens bears a far greater resemblance to the former than to the latter.

Independently however of these considerations, an attention to the nature of the alterations which take place in the centre of double flowers appears to me to prove that it is impossible that any retrograde action can influence the præternatural alteration of the parts of fructification. If we examine the various double flowers with which our gardens are enlivened, we shall find that the ovarium either continues to maintain its original form, notwithstanding any changes which may take place around it, or, that it is altogether

abortive, or, that it at once reverts to the state of a leaf, thus assuming the original simple form of which it would in its perfect state be a modification: as happens in what are termed proliferous flowers; but I am not aware that any example exists of the ovarium ever indicating the smallest disposition to become a stamen, or to retrograde; if altered, it either becomes abortive, or reverts to its primitive type; as in the double Cherry mentioned* by Sir James Edward Smith, in which the ovary had changed to a leaf of the ordinary appearance.

The contrary of this, namely the change of stamens into ovarium, in which the progressive action takes place, must be familiar to the recollection of many. The curious case of the Common Wall-flower (Cheiranthus Cheiri) in certain individuals of which the stamens constantly undergo this alteration, is one instance; that of the House-leek (Sempervivum tectorum) the anthers of which are frequently filled with ovula instead of pollen, affords another, and the double Barbadoes Lily, the subject of this communication, is a new instance.

Of this plant the petals were in the usual position and state, except that at their points of union at the base, was a slight tendency to distortion. Inside of them were nine other petals, quite similar to the exterior, and like them united at the base in an irregularly imbricated way. These I consider to be merely supernumerary petals, no tendency to an alteration of form being perceptible in them. Next these in the inside were nine other petal-like leaves, which were

* Introduction to Botany, Edit. 5, page 220.

much distorted and frequently halved down the middle, having a more or less perfect indication of an anther on either side. Here then the multiplication was bringing on transformation, and exhibiting in an obvious manner an attempt on the part of the multiplied petals to assume the functions of stamens by the formation of a polliniferous receptacle. Upon one of the most interior of the transformed petals above the unguis, I observed the presence of that glandular fringed process, which in the perfect flower is placed at the orifice of the tube of the corolla; where it forms a sort of annular excrescence. This fact alone might, even if unattended by any other evidence, be considered conclusive that the conversion, which was operating, was of the petals into stamens. Among the petaloid bodies were intermixed four unhealthy stamens, bearing anthers of the natural form, their filaments being neither petaloid, nor altered in any material degree from their usual appearance, except being shorter than common. The place of the ovarium was occupied by a deformed subulate process, much shorter than the petals, and cucullate at the lower end, where it enwrapped two other smaller appendages. In the usual situation no trace whatever could be perceived of ovula, but upon a more careful examination, I discovered three different places at the base of the innermost staminoid petals, where ovula were produced in sufficient abundance. In two cases the ovula proceeded from the edge of the body to which they were attached, and in the other case, two only appeared from a point which I did not discover to be marginal with respect to any organ. In the latter instance the ovula were collateral, in the others

they were imbricated vertically in a single row, as is represented in the accompanying magnified figure of a portion of the lower part of the flower.

From this description it appears that the male organs were converted partially into female, by the addition of ovula to their base, and that the ovaria themselves indicated no disposition to assume the functions of males, but were nearly obliterated.

This and other circumstances have therefore led me to conclude, as has been already stated, that the same laws which govern the production of the various organs of vegetation, exercise an undeviating influence upon their transformation also; that the latter consequently proceeds upwards in the order of developement, or from circumference to centre, and that the popular opinion held upon this subject is not

founded upon a just consideration of all the facts connected with metamorphosis.

That exceptions to this law may exist, although unknown to me, I am prepared to anticipate, for no attentive observer of nature can be ignorant of the singular caprice which it is her privilege to exercise, or of those frequent anomalies which shew how incomprehensible are her operations, and how little the human mind is capable of understanding her mysterious workings; but I think it may be affirmed that the principle above laid down is that by which she is guided in the great mass of her creations of this kind.

Before I conclude, I wish, in order to prevent misconception of my meaning, to observe, that the changes in the parts of a flower which take place either by mulplication, or transformation, or abortion of particular organs, are altogether of another nature from those which happen in Compositæ, where impletion is only apparent, and in which the metamorphoses depend upon laws of a different kind.

XXIX. *Notes on Grafting, Budding, and Cultivating* Garden Roses. *By* JEAN BAPTISTE VAN MONS, *M. D. Foreign Member of the Horticultural Society of London.*

Read May 4, 1824.

IT is generally believed that the Rose cannot be propagated by grafting, and that budding must be employed for the purpose; this however is a mistake, the former method succeeding as well as the latter.

For grafting,* scions are used of such a thickness that when fitted they may equal the stock in diameter; by making the slit short of the axis of the stock, the slenderest scions may be used. The scion is to be cut on both sides, so as to form an elongated wedge, and the bark of the stock must be made to fit the graft on both sides; a ligature is afterwards applied, of fine bass, made water-proof by pressing it first through a solution of white soap, and next through one of alum. The ligature is finally covered with a coat of marly clay mixed with old slaked lime, and moistened with white of egg beat up with four or five parts of water. This material is applied with a hair pencil. The best stocks for this mode of grafting, are the shoots of any kind of Garden Rose.

We employ in Flanders the same mode of grafting with the Dog-Rose, only taking the precaution that the cleft be

* The mode of grafting here described, is what in English Gardening is called Crown Grafting. *Sec.*

of sufficient depth to allow the cut edge of the scion which is immediately above its cut part, to rest firmly upon the wood of the stock. The ligature in this case is of bass, and we cover it with white mastic made of Burgundy pitch, white wax, and boiled turpentine, with or without a little white size. Black masti cimbibes heat too much when exposed to the sun.

The Rose may be budded very well in the spring, if the buds are extracted with a small portion of wood adhering to them. For this purpose scions are cut before winter and stuck into the ground, till the moment when in spring the bark of the stock will run. To prepare the bud we make, firstly, a transverse cut into the wood a little below an eye, which incision is met by a longer cut downwards, commencing at a short distance above the eye, care being taken that a portion of wood is removed with the bark; this bud is inserted into the bark of the stock, which is cut like an *inverted* T thus, ⊥ the horizontal edges of this cut in the stock and of the bud must be brought into the most perfect contact with each other, and then bound with water-proof bass, without however applying grafting clay. Eight days after the insertion of the bud, the stock is pruned down to the branch, which is immediately above the bud on the opposite side, and this branch is stopped by being cut down to two or three eyes; all the side wood is destroyed, and when the bud has pushed its fifth leaf we compel it to branch by pinching its extremity, it will then flower in September of the same year.

You may also bud the Rose in the spring, without waiting till the bark separates, by placing the bud with some wood

on it in a niche made in the stock, similar to what would be formed by taking an eye for budding from it in the manner above described, and into which it is fitted exactly with a slight pressure. It is recommended to make the cut for the niche where there is already a bud on the stock; when placed, the bud is then bound with bass and covered with mastic.

For budding in June, I deprive the young shoots, of the plants I desire to cultivate, of their leaves, and fifteen days afterwards the eyes at the axils of the leaves are sufficiently swelled to allow of their being taken off, and inserted as buds. The shoots from these buds often bear even in the same year many flowers.

In August and September, we insert our buds upon stocks that have not been pruned; they are placed upon the old wood, not only because we bud low, but because this succeeds best.

Whatever be the period at which budding is done, if the plant be well pruned on all its branches the bud does not fail to push.

The scion of a Rose tree is seldom too dry to take, when the bud is inserted with a thin bit of wood behind its eye. I have thus budded successfully from scions that had remained in a drawer for ten days. When cuttings for buds are to travel, I pack them in long grass, and surround them with straw disposed longitudinally.

We prefer to graft and bud our Roses not more than six inches above ground, firstly, in order that the whole head of the bush may be exposed to the eye of the observer, and, secondly, because the union is more certain, and the plant keeps the earth about it moist by its own shadow. Besides,

it often happens, in bending down the stem of high plants, to see their flowers, that their stem is injured and the buds displaced by the curiosity of persons desirous of minutely examining them.

At the pruning season, the branches of the budded plants which are formed into a head, are annually cut down to nine inches in length, and we do the same thing with our Roses which are not budded; we thus obtain a great deal of young wood, and a bushy plant, as well as a very large number of flowers. The pruning is performed at the end of January; all the four-year old wood is cut entirely back, and the plants themselves are taken up and renewed at the end of eight years.

Whenever we wish to make our Roses flower in the autumn, we prune them back in the spring, as soon as we can discover their flower-buds.

In order to obtain stocks, we take from the woods and hedges suckers of the Dog-Rose, which is very abundant in Flanders, and which like every other tree or shrub increasing itself spontaneously, has its roots bent like that of a layer. We select plants without lateral branches, and take them up before winter, to be planted into their places after the winter, and we cut down the stem to a foot and a half in length. The stocks make suckers most usually the year after budding, but afterwards in greater quantity; we do not destroy these suckers, but in the following spring we lay them down to the depth of an inch or more, and leave only the end of the sucker above-ground. Each eye forms a cluster of roots, and furnishes a very fine stock which is taken up after winter. When a bud has missed, which rarely

happens, we cut the stock down to half an inch under ground; we then obtain many suckers which we lay in like manner; these shoots will naturally take a vertical direction, in which they should be preserved by a slight stake, which strengthens them singularly, and would make them well fitted for being budded when young, if it were not preferable to select for that purpose wood of two or three years old. In the year that a plant is intended to be budded, care must be taken to prune back all its branches, including the top.

XXX. *Account of several* New Chinese and Indian Chrysanthemums, *with additional Observations on the Species and Varieties, and on the Management of the Plants in Gardens. By* JOSEPH SABINE, *Esq. F.R.S., &c. Secretary.*

Read, January 17, 1826.

AFTER an interval of two seasons, I again* present myself before the Horticultural Society, with descriptions of New Chrysanthemums. In that interval very extensive and beautiful additions have been made to the number of the varieties cultivated in this country, which it is necessary should become known to the collectors of ornamental plants, through the same medium of communication, which has hitherto been used. The success which has of late years attended the endeavours to increase the number of the varieties, and the general improvement in the knowledge of their treatment and cultivation, have raised this class of plants into the first importance with the admirers of beauty and variety in flowers. In the two last seasons, the exhibition of Chrysanthemums in the Garden of the Society has been generally allowed to be the most splendid one of flowering plants in one mass, that has ever been seen, and superior to any other garden exhibition at even the gayest period of the year.

Chrysanthemums in pots, in full flower, to the amount of about seven hundred, were placed together in one of

* See Horticultural Transactions, Vol. v. page 412.

the curvilinear iron houses, without the admixture of any other plants, and were continued, by changing the pots and the introduction of the later varieties in succession, in a state of perfection and splendour from the end of October to the middle of December; thus enlivening the garden at a period when nothing else existed to attract attention. In the season just ended, the great extent of novelties has given additional interest to the exhibition. A description and account of these are the principal objects of the present communication.

I have before noticed* the expectations that were formed, of considerable accessions to our stock of Chrysanthemums, from the mission of Mr. JOHN DAMPER PARKS, who was sent to China on account of the Society, on board the Lowther Castle, Captain THOMAS BAKER, in the year 1823. He was instructed to collect, amongst other rarities, as many good varieties of Chrysanthemums as possible.

Part of his collection was sent home by him, and arrived in the spring of 1824, on board the General Kyd, commanded by Captain NAIRNE.† The remainder were brought by himself in the Lowther Castle, which arrived in England in the month of May subsequently. The number of distinct living Chrysanthemums received by these two conveyances was twenty; four of them proved to be sorts previously in this country, the rest are new, and are now to be described.

* See Horticultural Transactions, Vol. v. page 427.

† The Society is also under obligations to Captain NAIRNE for the care of and attention shewn to Mr. JOHN POTTS, the Gardener of the Society, who went with him to Bengal and China, on board the General Kyd, in 1821, and returned with him in 1822; bringing home a valuable collection of plants.

Besides these, a few more novelties have been added to the collection from other quarters; Mr. Reeves, who returned to England on board the Warren Hastings in 1824, brought with him a few Chrysanthemums, which he gave to Mr. Samuel Brookes, of Ball's Pond, who presented plants of them to the Society. Two of these are new; the first of them is similar to one of Mr. Parks's, the other is a distinct kind. Captain Mayne, whose services in the introduction of Chrysanthemums for the Society in the year 1820 has been recorded in its Transactions,* also brought a collection of Chrysanthemums from China in 1824; these he presented to the late Duchess of Dorset, for the Garden at Knowle, having previously given cuttings of them to William Wells, Esq. of Redleaf. The Society received from Mr. Wells, as well as from Mr. Ashworth, the Gardener at Knowle, plants of these. Several of them turned out to be old kinds, but one has proved entirely new, and another of them corresponds with the new kind above noticed, brought by Mr. Reeves, as well as by Mr. Parks. These, with the addition of one, the origin of which is not known, and of two distinct varieties recently raised from sports, in this country, and hitherto undescribed, constitute the twenty-one new Chrysanthemums now to be noticed. This addition, to the twenty-seven sorts previously described,† makes our collection of varieties amount to forty-eight.

These have been introduced into the gardens of England at the following times, and in the ways stated. One was sent from Paris to the Royal Garden at Kew in 1790, having been

* See Horticultural Transactions, Vol. iv. page 334, and Vol. v. page 151.

† See Horticultural Transactions, Vol. v. page 419-422.

imported from China into France in 1789; seven were introduced for Sir Abraham Hume, between 1798 and 1808 inclusive; one for Mr. Evans in 1802; one by Captain Rawes in 1816; one by Captain Larkins in 1817; one by Messrs. Barr and Brookes in 1819; one by Mr. Reeves in 1824; one by Captain Mayne in 1824; two have appeared without its being known who imported them; four are sports originating in England; and twenty-eight have been brought from China on account of the Horticultural Society, between 1819 and 1824 inclusive.

I now proceed with the descriptions of the new kinds.

1. *Pale Pink Chrysanthemum.* In my last communication,* describing new Chrysanthemums, I mentioned this kind as a novelty not yet sufficiently established to be introduced into the permanent list. It has however since proved itself as constant to its variation as any of the other sports which have been produced in this country. It was obtained in the autumn of 1822 from the Rose or Pink variety, in the Nursery of Mr. James Colvill of Chelsea, and a plant of it was soon after presented by him to the Garden of the Society. It differs in no respect from the Rose or Pink, except in the general colour of the florets, which are all very pale, those in the centre being paler than the others, sometimes almost white, and occasionally having a slight tinge of yellow. The period of blossoming is early, being of course contemporary with the Rose or Pink. Its colours not being brilliant, it will not probably be in great estimation. Though this kind is immediately derived from the Rose or Pink, it will be proper to consider the Buff or Orange strictly as its parent,

* See Horticultural Transactions, Vol. v. page 418.

the Rose or Pink being derived from that originally by sporting; and this is therefore its offspring, through the intermediation of its sport. In the open border and against a wall this kind grows well, and its flowers so circumstanced are very similar to those produced under glass.

2. *Early Blush Chrysanthemum.* Two plants of this variety were brought home by Mr. PARKS, in the Lowther Castle, in 1824, and were noted by him under the different names of Double Blush and Double White, they were probably obtained at different periods of their blossoming, for after the flowers have been for some time opened they lose much of their coloured tinge, and thus the two names may be accounted for. Captain MAYNE brought this plant with him from China in the same season, on board his ship the Atlas, and by him it was presented to the late Duchess of DORSET, in whose Garden at Knowle, as well as in that of Mr. WELLS at Redleaf, the kind had obtained the name of the New Blush Chrysanthemum. The imported plants blossomed at the above places, as well as in the Garden of the Horticultural Society, in 1824, but more perfectly in the present year. It is now called the Early Blush, from the period at which the flowers expand; they are open nearly as soon as those of the Quilled White, but far surpass that kind in beauty. The flowers are produced very freely, growing in loose clusters; they may be called nearly double, though they exhibit a moderately sized disk; they have an expansion of about three inches, but their circumference is not regular. The florets at first project forwards, and then turn outwards with a slight curvature backwards; they diminish in length pretty regularly from the outside, but do not become very

short even at the centre of the flower, which is hollow, showing the disc at the bottom. The florets are all expanded, not quilled, their surfaces furrowed, the outer ones are broader than those near the centre, their terminations are nearly all entire; the backs of the florets are neatly tinged with pale purple, the fronts are white, but exhibit the purple tinge through the substance of the florets, so as to give the whole blossom, when in its most perfect state, a delicate blush tinge. The leaves are an opaque green, rather elongated, with short footstalks, their lobes scarcely imbricated, divided by shallow indentures, and having their serratures bluntly pointed. The blossoms under glass are superior to those produced against a wall, but still the kind may be considered as a good out-door variety.

3. *Parks's Small Yellow Chrysanthemum.* Plants of this kind were collected in China for the Society, by Mr. PARKS in 1823, one of them was brought to England for the Society by Captain NAIRNE in the General Kyd, and another by Mr. PARKS himself, in the Lowther Castle, in 1824, in which year the imported plants blossomed nearly as well as they have done subsequently. From the general appearance and size of the flower, it may readily be mistaken for the Small Yellow Chrysanthemum described* in a preceding paper, but the leaves are remarkably different; besides, the blossoms of this sort open earlier, they are not so fully double, they are smaller, and the florets are without the dark colour at their backs, noticed in the other sort. The flowers are produced freely, and have a very neat appearance, with a regular and even circumference. The florets are

* See Horticultural Transactions, Vol. v. page 415.

bright yellow, and well expanded; the outer ones take a horizontal direction, whilst the inner gradually project so as to form a neat semiglobose head; they diminish in their length very regularly, but slightly, towards the centre, which rarely shows any disc; they are distinctly notched at their ends, and have their edges reflexed with their surface furrowed. The branches are rigid, with short joints, and produce flowers along their whole extent more than any other kind. The leaves are singular; they are dull green, broad and flat, having four nearly equal imbricating lobes with shallow indentures, the margins of the lobes are very slightly indented, and their serratures bluntly pointed; the small leaves at the end of the branches near the flowers are more simple than usual. The plants thrive and flower well against a wall, and there show their property of producing blossoms along the stems, better than when they are grown in pots.

4. *Blush Ranunculus-flowered Chrysanthemum.* Two plants of this were received in 1824 from China, one was sent by Mr. Parks in the General Kyd, and the other was brought by him in the Lowther Castle. The blossoms produced in this country, agree so well with the Chinese drawing of this variety, in the possession of the Horticultural Society, that I have been enabled thereby to affix to it the original name of the Blush Ranunculus-flowered; it is also called in China the Drunken Lady, on account of the rosy hue of its flowers. It is an early flowering kind. The branches are stiff and angular with short joints. A flower with an expansion of about three inches terminates each shoot; other smaller flowers, in number from four to six, grow below it on short footstalks, at little distances from each

other, and near to the first flower, forming with it a thick cluster or corymb. The florets are very numerous; they are short and project, composing a very regular and compact double flower, having very much the appearance of shell-work; the external florets are broad, and flatly expanded, having two longitudinal furrows on their under surface, they are notched at their ends; the florets in the centre are irregularly disposed, and are very convex; these at first, when unexpanded, appear smaller, and grow so thick together, that they give the centre of the flower a peculiar appearance at its first opening. The backs of all the florets are tinged with a purplish pink, less intense in the middle, than in the outer ones; the front of all is white, but has a gentle blush caused by the transparency of the substance of the floret, showing the purple colour from behind. After the flowers have been open for some time, the outer florets become tinged with purple. The leaves are somewhat recurved and have a crisp appearance, they are much indented, their lobes are imbricated, and the serratures of the lobes are deep and sharp pointed. The blossoms are produced freely in the open air against a wall, but the plants appear to suffer by the exposure.

5. *Tasselled Yellow Chrysanthemum.* The original plant was brought from China by Mr. Parks in 1824, on board the Lowther Castle, and was noted in his list as the New Sulphur Yellow; it was subsequently called Parks's Large Yellow; its present name seems more appropriate. It is a fine variety, growing tall and blossoming early, much at the same time with the Old Sulphur Yellow, from which it differs in having its flowers more clustered, rather darker

in colour, and especially in having a conspicuous disc. The florets of the ray are numerous, though they do not form a full flower; the expansion of the whole flower is about five inches; the circumference, from the unequal length of the florets, is irregular; the florets all project, and though not equal, do not vary much in length in the outer part of the flower, but towards the inner part they become shorter, leaving the centre hollow, and showing the disc, which is however sometimes covered by short linear florets, differing from the others not only in their length but in their breadth. Each of the florets of the ray is quilled a considerable part of its length, being very slender at the base, gradually enlarging upwards, and ending in a spoon-shaped opening, incurved at first but recurved afterwards, and notched at the end; the colour of the whole is pale yellow, without a tinge of any other hue. As the blossoms get older, the florets become mixed together, conceal the disc, and have a tasselled appearance. When the flowers begin to decay, the external parts are tinged with a dingy red. The leaves are long and narrow, reclined and convex, with long footstalks of an opaque green; they are deeply indented, with their lobes distinct, and the serratures sharp-pointed. This is a very splendid kind, it has not yet grown against a wall in the open air, but will probably succeed in such a situation equally as well as the Sulphur Yellow.

6. *Changeable Pale Buff.* This kind was brought home by Mr. Parks, in the Lowther Castle. The original plant flowered in 1824, but less perfectly than in the present season, it was then called the Pale Cluster; the name now given to it is more characteristic. The plant grows

Changeable Pale Buff Chrysanthemum.

Drawn by Wm. Clarke.

strong, though not tall, and shews its blossoms early in what may be called the second season, that is soon after the most early ones. The blossoms are produced abundantly in thick clusters or corymbs at the ends of the branches, and from the peculiarity of their appearance are attractive; they seem full, though not thick of florets, with an irregular circumference, the larger ones having an expansion of more than three inches. The florets project a little and spread themselves out so as to form a well shaped flower. The colours are pale. The florets are all expanded, the external ones being reflexed at their edges their whole length; these are of a gentle pink hue, but more tinged with that colour on their backs; there is a gradual transition of the pink in the entire flower, at about half way from the circumference, into buff or pale yellow; this is the colour of the internal florets, which are however sometimes marked a little with dull pink on their backs; their edges, when the flower is at its best, are incurved, and towards the centre they become less and linear, and turning inwards conceal a small disc. The leaves are dull pale green, large and broad, reflexed or curled back at their edges, lobed, but not deeply; the lobes are obtuse, the serratures of the lobes are very obtuse and shallow, but with sharp pointed terminations.

The blossoms of this variety are produced freely against a wall, but have not the delicate beauty of those under glass, the weather increasing the dark colour at the backs of the florets, especially of those in the centre of the flower. A figure of this variety, (Plate III.,) from a drawing made in the Garden of the Society by Mr. William Clark, has been engraved to accompany this Paper.

7. *Curled Blush Chrysanthemum.* This is a sport produced by the Curled Lilac Chrysanthemum. The original was imported* by the Horticultural Society in 1820, and was described† with other varieties in 1822. Plants of it were presented to various persons by the Society, and one of these produced a sporting branch in the garden of Robert Barclay, Esq., at Bury Hill, in 1823. The cuttings of the sport have preserved their character, and have made a very pretty addition to the collection; the parent variety has always been esteemed one of the most beautiful of the whole tribe. Other cases have occurred, in which this same sport has been produced, besides that in Mr. Barclay's garden, though that was probably the first instance. Cuttings taken from the Curled Lilac plant have also sometimes proved, when they blossom, the Curled Blush; these would of course have formed a sporting branch if they had remained on the plant. There is no difference between the sport and the original except in the colour of the flowers, which in the former are a delicate pale pink, becoming, after they have been open some time, paler and in the centre almost white. This sport will doubtless succeed as well in the open air as the Curled Lilac.

8. *Tasselled Lilac Chrysanthemum.* Was brought home in 1824 by Mr. Parks, on board the Lowther Castle, and did not shew its blossoms till the last flowering season. It flowers in the second season, and soon after the Changeable Pale Buff. It certainly is one of the best of the new acquisitions, being extremely beautiful as well as very pro-

* See Horticultural Transactions, Vol. v. page 151.

† See Horticultural Transactions, Vol. v. page 155.

rawn by Wm. Clarke. Engraved on Steel by

Two-colored Red Chrysanthemum.

ductive of blossoms. The plants appear inclined to grow to a moderate height. The flowers are produced in thick clusters at the end of the bunches, so thick that the florets of the different blossoms intermix. The expansion of the flower, is full five inches, with an irregular circumference. The florets are all quilled; they project slightly forwards, and are of an uniform lilac; they are slender and long, increasing in size upwards, and opening with a small spoon-shaped mouth, much broken at the end; those florets next the circumference are straight; in the inner part of the flower, half way from the circumference, the ends of the florets are at first incurved, afterwards straight; the whole are of various lengths, the longest being in the circumference, and gradually but not evenly diminishing in length towards the centre, where they are short. The leaves are bright green, of moderate size, with shallow indentures, the lobes are imbricating and very bluntly serrated; the serratures are nearly rounded, with obsolete points. It has not yet been placed abroad against a wall, but may be considered as likely to succeed in that situation.

9. *Two-coloured Red Chrysanthemum.* This plant came from China in the General Kyd, under the care of Captain Nairne, in 1824, and was also in Mr. Parks's own collection. It is remarkably different from any other variety, and is called in China the Golden-backed Red; in that country the backs of the florets are so yellow as to justify the name, but this remarkable character is not preserved by the blossoms in this climate, for though the imperfect flowers produced on the original plant in 1824 gave expectation of it, yet in the past season the posterior colour, though distinct,

cannot be assimilated to gold. It was called by Mr. Parks Semi-double Brown. The plant, though strong, is of dwarfish habit. The flowers are produced early in the second season, they are abundant, growing in clusters, but sometimes singly when the shoots are weak. The largest flowers have an expansion of about three inches, the florets of the ray spread out, with a very slight inclination forward, in the manner of a China Aster, being about an inch in length, and nearly equal; the disc is three quarters of an inch broad, remaining always conspicuous, and is bright yellow. The colours of the radial florets in the front are brownish red; at the back they are much paler, and towards the tips have a little inclination to dull yellow; their bases are bright yellow, and form a narrow circle of that colour round the disc. The whole of the florets are expanded and broad, with their ends more entire than in some other kinds, and their edges sometimes a little incurved, by which the colour of their back is occasionally exhibited in the front view of the flower. The leaves are small, very deeply divided into detached narrow lobes, the lobes being deeply and irregularly serrated; the serratures are rounded with sharp points. In the past season this kind has flowered well and abundantly against a wall, though it has not spread over much space. A figure, (Plate IV.), from a drawing by Mr. William Clark, is annexed.

10. *Pale Buff Chrysanthemum.* The original of this plant was imported by Mr. Reeves in 1824, and by him given to Mr. Samuel Brookes, of Ball's Pond, to whom the Society is indebted for the addition of it to their collection. It was at first called the Semi-double Quilled Buff,

but as that name was more applicable to another sort, it has been altered to that of Pale Buff. The original plant flowered imperfectly in 1824, and then appeared much less deserving of estimation, than it has become entitled to on its second blossoming. The plants grow tall, with strong branches and short joints, producing their blossoms plentifully, in loose clusters, on long footstalks. It is in flower in the second season. The flowers have an expansion of about three inches and a half, with a circumference nearly regular; they are semi-double, and exhibit a large disc. The colour of the florets is pale yellow, with a dash of pale red, which is strongest at their backs; this gives a general appearance of pale buff; the disc is a brownish yellow. The florets of the ray incline slightly forwards, and are of various lengths, some being an inch and a half long, but others are particularly short; they are quilled half their lengths, the lower ends being very slender and enlarging upwards; the openings are at first spoon-shaped, they become recurved after a time, and their openings are notched; a few short linear yellow florets, curling inwards, are occasionally interspersed about the disc. At an early period of their flowering, the florets of the circumference are all turned towards the left, giving the semblance of a Catherine wheel to their general appearance. The leaves are large, dark shining green; the divisions of the lobes are moderately deep; the lobes are variously serrated, in some instances deeply; the serratures are sharp-pointed. This has not yet been planted abroad, but will, in all likelihood, succeed against a south wall.

11. *Windsor Small Yellow Chrysanthemum.* Of the origin of this variety we are not informed; it was given by

Mr. John Aiton, of Windsor, to Robert Henry Jenkinson, Esq., and by him presented to the Garden in 1824. The shape of the flower prevents its being considered as a sport, for it does not agree with any other kind in that particular, and the foliage is generally so weak and imperfect, that no inference can be made respecting it, by comparison of it with others. The plant is of short stature, with weak branches. The flowers are produced on long footstalks, but not in clusters, and are open at an early period. The flowers are of small size, about two inches in diameter, with a circumference somewhat starry; they are uniformly bright yellow, with occasionally, when abroad especially, a tinge of red on the backs of the florets; they do not show a disc. The florets spread out almost horizontally, they are flat and narrow, diminishing pretty regularly towards the centre, with their ends occasionally slightly notched; those in the centre are short, linear, and erect, forming a sort of cone. The leaves are small, pale green, deeply divided, and the lobes are all slightly serrated, with pointed serratures. This kind flowers against a wall nearly as well as under glass, but from its weak habits is ill suited for such a station, when compared with others of greater strength.

12. *Clustered Pink Chrysanthemum.* For the first possession of this plant the Society is indebted to William Wells, Esq. of Redleaf, it came also from the Garden at Knowle, it being one of those introduced in 1824 by Captain Mayne, but was not in either of Mr. Parks's Collections. The early appearance of the flowers is very unpromising of beauty, but they change their character after a time, and then, though not strikingly handsome, from the peculiarity of their appear-

ance, attract much notice in a collection. The plant grows to a moderate length with strong branches and very short joints, bearing many flowers in a thick and somewhat lengthened cluster. In its early state the blossoms have a series of straight and quilled florets in the circumference, with a considerable disc, the middle part of which appears green, until the flower has advanced. In its perfect state the expansion is about three inches and an half, the florets in the circumference being straight in the lower parts, and a little inclined forwards at the ends; the disc is large, convex, and fully exposed. The blossoms are in perfection in the second season. The florets of the ray are sometimes two inches long, they vary in length, but not considerably; they are pale at the base, and a rich purplish pink upwards; those near the centre are paler and sometimes nearly white; the whole might probably become more so when grown abroad. The florets are quilled, angular, flattened, and furrowed, with a small opening at the top, which is rather hollow than spoon-shaped. It is the peculiar form of the florets, that constitutes the singularity of the character of the flowers. The leaves are broadish, dark green, much recumbent on their footstalks, and not regularly divided into five lobes as usual, but variously cut into shallow indentures, and the lobes thus formed have very shallow serratures, which are rounded and pointed at their terminations. No trial has been made of this plant in the open air.

13. *Semi-double Quilled Pale Orange Chrysanthemum.* Two plants of this were imported in 1824, one by Captain NAIRNE in the General Kyd, the other by Mr. PARKS in the Lowther Castle. It was called in the original list prepared by Mr. PARKS, Semi-double Deep Yellow, but the general

colour is certainly more what is usually termed orange, that is, a mixture of red and yellow, and therefore the name has been changed, being distinguished by its being generally paler coloured, from the Semi-double Quilled Orange, which was described* formerly in an imperfect state, but which has subsequently shewn itself so different that I have given a corrected account of it, in a subsequent part of this Paper. This new plant has but little merit. The blossoms are produced in loose drooping clusters; the second flowers are often imperfect; they appear about the end of the second season. The flowers of the ray are confined nearly to the circumference, and are not very numerous; they spread out horizontally, and vary in length, from two inches to half an inch; they are quilled, slender, angular, and furrowed; when young a deep orange, when fully grown so much paler as to be nearly yellow; their openings are various some very small, others exceeding a quarter of an inch in length; their extremities are notched. The disc is large, greenish at first, afterwards pale yellow. The leaves are small, pale green, deeply divided, with the serratures of the lobes sharp-pointed. Against a wall this plant makes but an indifferent appearance, but in such situations the florets, both before and after their expansion, have a much darker appearance, the red colour predominating.

14. *Starry Purple Chrysanthemum.* Was one of the plants brought home by Mr. Parks in 1824. It comes into flower at the beginning of what may be called the third season of the class, and is assuredly a fine variety, attracting notice both on account of the shape and the

* See Horticultural Transactions, Vol. v. page 412.

colour of its blossoms. The plant grows rather tall, and is well furnished with leaves; it produces many branches; these are terminated by broad loose clusters or corymbs of flowers. The expansion of a good flower exceeds three inches and a half. From the inequality of the florets in the circumference, the outline of the flower is very irregular; this, and the pointed terminations of the florets, give it a very star-like character. The florets do not project forwards, but spread out nearly horizontally, so as to form a flattish flower; no disc is seen. The florets are a rich purple, paler where their anterior surface is exposed, and very pale at their extremities; those in the centre are much darker; they are quilled about half their length, sometimes rather more than in that proportion; their openings are at first flat and afterwards recurved, and their ends sharp-pointed, generally entire; from the circumference inwards, there is a gradual diminution of the length of the florets; at the centre they become narrow and incurved. At an early period, the blossom puts on somewhat the appearance of the Large Lilac Chrysanthemum, except that it exhibits no disc, and that the open part of the florets is much paler; after a time the florets in the centre lose their darker colour, become like the others, and the whole flower then is an uniform pink. In China the flowers are much larger, and the plant, according to the information communicated by Mr. PARKS, occasionally sports in the gardens of Canton, producing a perfectly white flower. The leaves are smallish, reflexed, grayish green, and rather deeply divided; the lobes narrow, and very slightly serrated, with pointed serratures. It succeeds well against a wall, producing its blossoms rather late; it is not strong in its growth.

15. *Golden Lotus-flowered Chrysanthemum.* This variety was brought to England by Mr. Parks in 1824 in the Lowther Castle, and blossomed the season it arrived. The name is a translation of the original Chinese appellation, the correctness of which has been proved by comparison with a drawing made in China, by the artist employed there for the Horticultural Society. The plant is strong, growing to a tolerable size, and producing its flowers plentifully in the second season, in loose corymbs at the ends of its branches. The expansion of a good sized flower is about three inches and an half, with an uneven circumference. Mr. Parks states that in China they grow much larger, and are there very grand. The florets project a little forwards, and then spread out widely, so as to form a flatly opened flower, with an hollow centre; before they are fully expanded, their inner florets are incurved, and cover the disc, which, when the whole is fully blown, appears in view. The colour of the florets is uniformly a rich deep yellow, they are of different lengths from two inches, to an inch and a half: the longest, though mixed with shorter ones, being most removed from the centre; they are quilled a short part of their length, the open part is very broad, furrowed, flatly expanded, contracted, and slightly notched at the end. The blossoms are far superior to either those of the Golden Yellow or the Sulphur Yellow, not only from the richness of the colour and the breadth of the florets, but from their being usually nearly entirely free from any stain of red on their backs. The leaves are large dull grayish green, slightly recurved, more indented towards the base than in the upper part; the lobes are not imbricated, they are sharply but not deeply

serrated, and the ends of the serratures are sharp and pointed. In the open air against a wall this kind succeeds apparently as well as under glass.

16. *Brown Purple Chrysanthemum.* This kind was brought home by Mr. PARKS in the Lowther Castle in 1824, but did not shew its flower till the present season. The plant grows very tall, producing many flowers in small loose corymbs at the ends of the branches; it is later in blossoming than any kind yet described in this Paper, coming out about the same time as the Superb White. The expansion of a good flower is about three inches and an half, but it appears less, from the great irregularity of its circumference, which is caused by a few of the florets there considerably exceeding the others in length. The florets taking a horizontal direction, the blossoms appear quite flat, and are fully double without any apparent disc. The general colour of the front of the florets is a brownish purple; their backs are grayish purple, which is very striking when contrasted with the front colour, it is however but little seen except when the edges of any of the florets are turned forwards. The florets are of different lengths, those of the circumference irregular, as before noticed, but from the circumference to the centre they diminish very uniformly; a few of them are quilled a considerable part of their lengths, but the quilled parts are not visible without examination, except in those florets which are at the back of the flower; the florets are flatly expanded, their ends are obtusely pointed, and their edges after a time become slightly recurved; but those towards the middle part are incurved, whilst the flower is in perfection. The leaves are small, flat, palish green, not very deeply lobed; the lobes

have sharp-pointed, shallow serratures. This kind grows and blossoms well against a wall, with very little difference in the appearance of the flowers from those under glass, except that they are somewhat less brilliant in colour.

17. *Two-coloured Incurved Chrysanthemum.* This was imported by Mr. Parks himself in the Lowther Castle in 1824, and blossomed, though imperfectly, in the same season. Of all the recent introductions it is perhaps the most striking, though not remarkable for the brilliancy of its colour. The plants are strong and grow tall. The blossoms are expanded late, about the same time with the Superb White: they are produced at the ends of the branches in clusters of few flowers, the side ones being much inferior in size to the centre or principal. The expansion of one of these last is about three inches, of the best of the others not above two inches and an half. The circumference of the flower is very even, the florets spread horizontally, and their ends turn forwards; they progressively diminish in length towards the centre, the outer ones overlapping those within. The outer florets are quite expanded, very broad, somewhat furrowed, their edges slightly incurved, and their ends much so; they are yellow a little way at their base, which on the inner side is shaded into a dull brownish red, this being the chief colour; their backs are striped with yellow and the same red, the latter predominating towards the end, but the tips have more yellow, and from the incurvature of the florets this colour is brought into view, and produces a beautiful effect. The inner florets are much narrower, but their edges as well as their ends are incurved; they have the same colour as the outer florets, and are nearly similarly disposed, except that

there is more yellow on their bases, and that the incurved edges are yellow. There is no apparent disc. As the flowers get older the florets become more incurved, especially towards the centre, and exhibiting only their backs, have an appearance entirely different from that of their earlier state, the whole flower being at the last expanded. The leaves are rather large with deep indentures, the lobes are irregularly serrated, with sharp-pointed serratures. A strong plant was placed, in 1824, against the south wall in the Arboretum in the Garden of the Society, and last season produced its flowers not only much larger, but considerably earlier than those under glass in pots. It is therefore probable that in another and future seasons, the blossoms of the housed plants will be superior in size to those produced in the present year, and also earlier. From the circumstances stated respecting the outdoor plant, it will of course be understood that this variety will do well in the open air against a wall.

18. *Late Quilled Yellow Chrysanthemum.* This kind was brought to England by Mr. PARKS in the Lowther Castle in 1824, but did not flower in that year. It is so late in blossoming, and when out, apparently (from what has hitherto been seen of it) of such inferior merit, that it will not be extensively cultivated, except where all the varieties are to be collected together. The plant is of moderate height, producing one tolerably perfect flower at the end of each branch, and other imperfect ones from the sides; the whole if perfect would form a loose corymb. The florets project and form an upright tassel-shaped flower, which when fully blown has a diameter of about two inches. The florets are all an uniform pale yellow, very slender, generally about an

inch in length, flattened, and quilled their whole length, with a small jagged or notched opening at their extremities; they rise from all parts of the receptacle, but are sometimes more numerous in the circumference than in the centre; there are no tubular florets, but the receptacle is thickly studded with dark-edged green paleæ, longer than those appendages generally are in other varieties, and from amongst them the quilled florets arise. The leaves are narrow with broad intervals between the lobes, the terminating lobes being longer than usual, the serratures of the lobes are deep and obtuse, with a terminating point.

19. *Yellow Warata'h Chrysanthemum.* This was one of Mr. Parks's own importation in 1824. The original plant produced a single blossom very late in that year. No flower however appeared on the plants either in the house or against the wall in the past season, from which circumstance it may be inferred that it will not be a kind on which much dependance for ornament can be placed. The whole appearance of the plant, in its general habit, the nature of its flowers, as well as in the shape and character of the foliage, is so different from that of Chinese Chrysanthemums generally, as to induce a belief that it has probably originated from, and may be referred to some distinct species. A short note of the blossom seen last year having been preserved, enables me to give the following description of it. The whole of the flower both ray and disc was yellow, the florets of the ray were in single series in the circumference only, they were narrow and pointed, and being of different lengths, gave the flower a starry appearance; the florets of the disc though tubular were lengthened, and considerably elevated, their

mouths being deeply divided into five segments, the whole had a character which induced its present name from its resemblance to the appearance of a Warrata'h Camellia. The stem of the plant grows bending, not upright, it is short, and thickly furnished with leaves. The leaves are broadly ovate, decumbent on the petiole, with very large stipulæ; they are irregularly five-lobed, the divisions of the lobes are shallow, and the serratures of the lobes irregular and unequal, mostly broad and sharp-pointed. The surface of the leaf is blistered. The plant seems to be hardy, and therefore its deficiency in blossoming may be attributed chiefly to the want of sufficient light and continuation of warmth in the latter months of the year.

The two new plants which remain to be described, are of that class of small flowering Chrysanthemums which I have* formerly considered as double varieties of the real Chrysanthemum Indicum of LINNÆUS, and which I subsequently endeavoured† to establish as being specifically distinct from the Chinese Chrysanthemum, the type of which I designated as Chrysanthemum Sinense.‡ In preceding publications I expressed§ a hope that these plants, though of less brilliancy and beauty, would make a portion of some future importation from China,

* See Horticultural Transactions, Vol. iv. page 328, and Linnean Transactions, Vol. xiii. page 561.

† See Linnean Transactions, Vol. xiv. page 142, and Horticultural Transactions, Vol. v. page 427.

‡ In the Catalogue of Plants cultivated in the garden of Messrs. AUDIBERT, at Tonelle, near Tarascon, published in 1825 (page 27), this species is denominated Chrysanthemum Varians, on the authority of M. De CANDOLLE.

§ See Linnean Transactions, Vol. xiii. page 577, and Horticultural Transactions, Vol. iv. pages 329 and 330.

and I have now the satisfaction of recording in part the completion of my expectations.

20. *Chrysanthemum Indicum flore pleno luteo. Double Yellow Indian Chrysanthemum.* This was brought home by Mr. PARKS in 1824, in the Lowther Castle. It has not produced any flowers in pots under glass, but it blossomed tolerably well, though late, against a south wall in the beginning of December, growing vigorously and continuing in full flower until stopped by frost. The blossoms first appear at the ends of the branches, on short footstalks, in small close corymbs, consisting of three or four flowers. Below these, on the stem, there spring from the alæ of the leaves for a considerable way downwards, short leafy footstalks, each bearing a single flower; these open after those at the extremity. The flowers are small, not exceeding an inch and a half in diameter, of an uniform deep yellow; the florets of the ray grow in a single series in their natural position, they are short, flatly expanded, with two longitudinal furrows on their surface, and with notched extremities; they spread horizontally, and are partly concealed by the elevated florets of the disc; these latter rise above the usual level of the disc, with rather a flattened surface, they are angular and somewhat enlarged towards their summit, which is five-cleft, having the segments a little spreading. The florets of the disc are destitute of stamens, contrary to the usual structure of that part of the inflorescence in Chrysanthemums. There are no paleæ in the receptacle. The branches extend to a considerable length when trained, when left to themselves they spread about and do not grow upright. The leaves are numerous, small, rather dark and shining, deeply divided, the lobes slightly imbricated, and the

segments sharply serrated and pointed. An original drawing from China, of this variety, is in the collection in the Library of the Horticultural Society.

21. *Chrysanthemum Indicum flore pleno albo. Double White Indian Chrysanthemum.* This plant also came with Mr. Parks in 1824, it blossomed for the first time in the present season. In the stems, leaves, and general habit, it is not distinguishable from the preceding kind. The whole of the flower is white, but it agrees in every other circumstance with the Double Yellow variety, except in size. Its expansion does not exceed an inch. Only one flower opens at first at the extremity of each branch, the remainder of the corymb expand later. The period of its blossoming is more than three weeks after the Double Yellow, for I was not able to get flowers well fitted for description till about Christmas, and then only the terminating blossoms were open; those on the lower parts of the branches were at that time in a very backward state, and the whole were destroyed by frost before they were properly expanded. The plant which produced these grew well and vigorously on a south wall, but those in pots and under glass did not shew blossoms at all. A drawing of this variety has been recently received from China into the collection in the Library of the Society; the footstalks of the flowers are represented in it as rather more elongated than those which were produced in the Garden of the Society, and the side shoots are figured bearing corymbs of flowers, not single blossoms.

When I published* my observations on the two species of Chrysanthemums from China, in the Transactions of the Linnean Society, and annexed the synonyms of different authors

* See Linnean Transactions, Vol. xiv. page 142.

to my characters of them, though I referred the Chrysanthemum Indicum of Loureiro to my C. Sinense, I did not quote his* C. Procumbens as belonging to the Chrysanthemum Indicum of Linnæus, though his reference to Plukenet's Matricaria Sinensis minore flore, &c. would perhaps have justified it. I was deterred by the description of the procumbent character of the stem of his species, which certainly did not at all accord with the appearance of the plant I had under my observation. However, since my examination of the two varieties just noticed, it appears to me that Loureiro's character, and consequently his name, may be founded on the cultivated varieties which he describes, and not on a plant in a single state of inflorescence. The descriptions of Loureiro are not generally considered as particularly accurate, and a general accordance of plants with them may therefore be sufficient to identify them, which I am therefore disposed to do in the present case.

The *Small Yellow Single Chrysanthemum*,† which should with more propriety be called the *Single Yellow Indian Chrysanthemum*, has flowered this season in the Garden of the Society; it had before blossomed in December, 1821, but not in the interval, for want of that high autumnal temperature which is necessary to advance its flowers. It was described in the Paper above referred to, and though of more upright growth than the double varieties now noticed, has evidently a general specific accordance, but whether it should be considered as the actual type of the species, or only as a cultivated

* Loureiro, Flora Cochinchinensis, page 499, and Willdenow's Edit. Vol. ii. page 610.

† See Horticultural Transactions, Vol. v. page 159.

variety with single flowers is uncertain; it is more probably the latter. All the cultivated varieties, according to LOUREIRO, have small flowers; he has particularly mentioned four. —The 1st, with double ligulate yellow flowers; this agrees with the figure published in the Transactions of the Horticultural Society,* from a drawing belonging to the East India Company. The 2nd. With a yellow ray and disc; probably the Double Yellow Indian here described. The 3rd. With a yellow disc and white ray; of this we have not yet obtained a plant, nor seen a drawing. The 4th. With the disc and ray white; this is, I suppose, the Double White Indian.

The conversion of the tubular florets of the disc into a more ornamental form by elongation and enlargement, instead of their becoming ligulate florets, is a mode of variation in Chrysanthemums I was not before acquainted with. It exists in the two above described varieties of the Chrysanthemum Indicum, as well as in the Yellow Warata'h Chrysanthemum; and as there is no other instance of this kind of variation in the Chinese Chrysanthemums, the circumstance gives additional strength to the supposition that this plant belongs to a distinct species. The first of LOUREIRO's varieties of C. Indicum above noticed, has a multiplication of ligulate florets, like the varieties of C. Sinense.

In the preceding description of the Chinese Chrysanthemums, I have omitted any notice of the scent of Chamomile in the flowers, which, in fact, with one exception, is common to the whole of them, though differing in strength. The excess appears to exist whenever a greater portion of the

* See Horticultural Transactions, Vol. iv. Plate 13.

tubular florets are produced in the disc; the plants which are without these are not entirely destitute of the scent, but have it in a less degree. The Quilled White is the only variety of Chrysanthemum Sinense which has an odour differing from the others; that has been justly assimilated to the smell of new honey-comb. The Quilled Pink has been supposed* to possess a similar scent; it has it however very slightly, and that only occasionally. The odour of a large collection of Chinese Chrysanthemums when in a house, is far from unpleasant, though it cannot be called fragrant. The scent of the varieties of the Chrysanthemum Indicum is very different from that of Chamomile; it is slightly pungent, and somewhat aromatic.

In some of the varieties of Chinese Chrysanthemums, in the present season, especially on the blossoms of the darker flowering kinds, I observed an appearance which I suppose is that described by M. Ramatuelle,† as a small sweet-scented dust, sprinkled on the ligulate florets of the blossoms of the Old Purple Chrysanthemum. This was only however observed at Marseilles, and not at Paris. It may have been always more or less visible on the blossoms in this country, though hitherto unnoticed, but the production of it this year more conspicuously, may have been caused by the superior heat and dryness of the summer, which infused into the plants a greater vigour than usual. Very minute shining oblong bodies are produced irregularly on the surfaces of the florets, having the appearance of solid transparent exudations growing

* See Horticultural Transactions, Vol. v. page 150.

† See Horticultural Transactions, Vol. iv. page 336, and Journal d'Histoire Naturelle, Vol. ii. page 237.

out of the cuticle, which M. Ramatuelle has described as resembling dust. I could not discover any scent arising from them.

I avail myself of this opportunity to make some corrections and additions to former descriptions, the defects of which were caused by the imperfect state of the blossoms, or other circumstances at the period when they were originally made.

The *Quilled Pink Chrysanthemum.* In the descriptions* of this variety hitherto published, it is represented as not producing many flowers, a defect which, joined to its lateness, has, notwithstanding the great beauty of its blossoms, caused it to decline in estimation. The plant however which was afterwards imported for the Society by Captain Mayne in 1820, and which has been† hitherto considered as a duplicate of that originally described, has subsequently been ascertained to differ from it in being much more free in producing blossoms; it has therefore been substituted for the original in the collection of the Society. In its leaves and the character of its flowers there is no variation; a slight difference in the colour of its blossoms is perceptible, they are a shade paler.

The *Semi-double Quilled Pink Chrysanthemum,* has proved a much more beautiful variety than it was originally described‡ to be. The outside of the florets of the ray is a rich purplish pink, which is much darker when the plant is grown in the open air; the inside of the florets is pure white,

* See Horticultural Transactions, Vol. iv. page 350, and Vol. v. page 150.

† See Horticultural Transanctions, Vol. v. page 159, and page 414.

‡ See Horticultural Transactions, Vol. v. Plate xvii.*

and this forms a beautiful contrast to the pink of their external surface.

The description and figure of the *Semi-double Quilled Orange Chrysanthemum,* published in the Transactions,* were made from the first flowers produced in this country. The plants having become more established and stronger, now exhibit characters in their blossoms, which require notice as well for the sake of correctness, as to bring under observation one of the most singular variations in the tribe. The florets of the ray are in all cases, when the plants are strong, and especially against a wall, very numerous; they are however still ranged in the circumference, leaving a very broad disc, but in this disc there are occasionally a few long ligulate florets, produced not regularly, but issuing from various parts of the receptacle amongst the short tubular florets; sometimes, though but seldom, these are so numerous as nearly to conceal the disc. The very slender appearance of the long florets in this kind, makes its general character differ remarkably from all others.

The *Late Pale Purple Chrysanthemum.* This variety, which was originally† described as the *Large Pale Purple,* but has since been more known under the name now given to it, is one that will be but little sought after, except by the general collector, or for the purpose of growing it in the open air. After the mild and frostless Christmas of 1824, it came into flower against a south wall in January. In the last season the flowers were well expanded in the same situation in the

* See Horticultural Transactions, Vol. v. Plate xvii.**

† See Horticultural Transactions, Vol. v. page 413.

middle and at the end of December, and until the severe frost which occurred in January. From the experience of its cultivation in the Garden of the Society, it seems to succeed best in the open air; those plants which have been grown in pots and not under glass, having produced weak and inferior flowers. Its blossoms have some peculiarities, not mentioned in the former account, which deserve attention. The disc is large, flat, and when the flower is expanded appears green, in consequence of the tubular florets not being open; the florets of the ray spread out quite horizontally, and form a large flat flower with an irregular circumference; the quilled part of the florets in a good flower is shorter than has been before stated, they are also white at their base, which being seen in the front, gives the appearance of a white circle round the disc. The florets are very unequal in length, the expanded parts are broad, furrowed, slightly recurved, and are an uniform pale purple. Many of the florets of the ray, especially those near the centre, produce form the inside of their tubes one, two, or more short petal-like filaments of the same colour as the expanded part of the floret; these originate from towards the base of the floret, and are evidently an effort of the flowers to become double. I have not observed this circumstance in any other Chrysanthemum; it appears however to have been noticed in China, for in the original drawing of this kind which is in the collection of the Society, these filamentous additions to the florets were represented.

Among the new plants described in the present Paper, two cases* of sporting are recorded as having caused the

* The *Pale Pink* and the *Clustered Pink* Chrysanthemums.

establishment of permanent varieties. Instances of this operation of nature are likely to occur more frequently, and it is therefore desirable that cultivators should be correctly informed as to what points they are to attend, both in propagating the sport, and observing on what they may consider as such. On the appearance of a sporting branch, part of it should be taken off for propagation in the season of its appearance, because it is not certain, though probable, that a sporting shoot will be produced by the old plant in the next year, and as the branches are only annual, the increase of the sport by cuttings must not be deferred to the spring. The sport never deviates from the shape and character of the leaves, nor from the habit of the parent plant; the flowers alone are altered, and this is done either by change of colour, or by conversion of quilled into expanded, or of expanded into quilled florets.

The sporting plants already noticed, are, 1st. The Purple, which produced* the Changeable White in England. 2nd. The Expanded Light Purple, and the Quilled Light Purple, which having been imported† from China separately, it cannot be ascertained here, which was the original. 3rd. The Curled Lilac, from which the Curled Pink has lately been obtained in our Gardens, as noticed in this Paper, and 4th. The Buff or Orange, which sported in China to the Rose or Pink: these two kinds were separately imported,‡ though the latter was produced subsequently in this country from the Buff or Orange, which is therefore § considered the original. This

* See Horticultural Transactions, Vol. iv. page 336.

† See Horticultural Transactions, Vol. v. page 153, 154, and 155.

‡ See Horticultural Transactions, Vol. iv. page 344, 345, and 346.

§ See Horticultural Transactions, Vol. v. page 416.

latter has been either directly, or through the medium of the Rose or Pink, the parent of other sports. The actual origin of the Small Yellow has not,* and probably now cannot be ascertained precisely, but from its frequently producing branches bearing flowers of the Rose or Pink, it probably sprang immediately from that kind. The Pale Pink is known to have originated from the Rose or Pink.

To some persons, the having plants producing sporting branches may be a matter of amusement; for this purpose sporting plants should be procured, and as such they are best kept against a south wall; but it must be recollected,† that the reproduction of sporting branches by any particular plant is not to be depended on. In this way the Changeable White sporting to Purple, the Orange sporting to Pink, the Small Yellow sporting to Pink, which frequently occurs, and the Curled Lilac sporting to Curled Pink, have fallen under my observation in the Garden of the Horticultural Society. The reverse of all these may also perhaps be occasionally seen, and it may be possible to find an Original Orange Plant, or an Original Pink Plant, with two or more separate branches with a different sporting colour on them, viz. either Orange, Pink, Yellow, or Pale Pink. Neither the Expanded Light Purple, nor the Quilled Light Purple, have yet within my knowledge sported in this country.

It is most usual that the sport is an entire branch proceeding from the root, but I have seen instances when a part of a branch has exhibited a sport. It sometimes occurs

* See Horticultural Transactions, Vol. v. page 416 and supra page.

† See Horticultural Transactions, Vol. v. page 416.

with the Buff or Orange, and its derivations, to throw out a parti-coloured flower, such as some Rose florets mixed with the Buff, or a flower Yellow on one side and Rose on the other.

Those who wish to exhibit different flowers in the same pot, may obtain their object in an easier manner than by procuring the sporting plants. Cuttings or small plants of the different kinds derived from the same origin, may be planted in the same pot, and when they produce the blossoms, as their leaves are exactly similar, they will have the appearance of the same plant yielding differently coloured flowers; the pots used for the purpose should be large, to give full support to the increased quantity of roots.

From an original drawing in the possession of the Horticultural Society, it appears as if the Chinese obtained a variety of coloured blossoms together by means of grafting. Several different kinds, and those not sports from each other, are represented in the drawing as all branching off from one common stem, which is divided near its base into several shoots bearing different varieties of Chrysanthemum.

Since the publication of the list of figures, and the two plates, in the last* Volume of the Transactions of the Horticultural Society, Dr. Sims has given in the Botanical Magazine, folio 2556, a representation of the Expanded Light Purple Chrysanthemum; this, with the figures of the Changeable Pale Buff, and the Two-coloured Red, which have been engraved to accompany this Paper, make the number of published representations in this country, eighteen.

The Continental Gardeners have been in possession some

* See Horticultural Transactions, Vol. v. page 423, and Plates xvii.* and xvii.**

time of the earlier imported sorts. In the list of plants cultivated in the Botanic Garden at Pisa, twelve sorts are enumerated. Messrs. Audibert of Tonnelle, near Tarascon, appear by their catalogue to have also twelve sorts in cultivation. In the Bon Jardinier* for 1822, the Editor enumerated thirteen kinds, which are noticed as having been introduced by M. Noisette into the French Gardens; the same account is continued in the Bon Jardinier for 1825. In all these cases the names given to the varieties are principally founded on the colours of the blossoms, but do not appear to correspond with those by which they are known in England. Each of these foreign collections is besides differently named, and it is impossible without a comparison of the plants to identify them. When M. Noisette visited this country in 1824, he was presented (together with several other plants from the Garden of the Society) with the twenty-seven sorts of Chinese Chrysanthemums then described, and a list of them is attempted to be given in the "*Nouvelles*" of the Bon Jardinier for 1825, page 35, but their names are very inaccurately printed, so much so, that some can scarcely be recognized.†

Considerable improvements in the cultivation of the Chrysanthemums, have been made within these few last years in the Garden of the Society. An account of the management of

* See Bon Jardinier for 1822, page 568, and for 1825, page 433.

† Whilst this Paper was in the press, the Bon Jardinier for the year 1826 has been received; in this Edition names in French and descriptions corresponding to those of the first twenty-seven sorts, enumerated in pages 419, &c. of the fifth Volume of the Transactions of the Society, are correctly given.

them in pots has been prepared by Mr. MUNRO, to be laid before the Society.

All the older sorts, and many of those now described for the first time, have been planted against the south wall of the Arboretum, in the Garden of the Society, where it is proposed constantly to keep the whole collection, adding new acquisitions when they arrive. In such a situation, by far the greater part of the varieties succeed admirably, and continue in beauty for a long period; some are not so well suited for this purpose; and therefore in private collections, a selection only of the kinds should be so placed; the tender and weak growing plants should be rejected. The late flowering sorts in most cases, contrary to what might have been expected, have more vigour and show more splendidly abroad in this manner, than in pots under glass.

The practice of reducing the number of flower buds, recommended by Mr. JOSEPH WELLS,* answers equally as well in the production of large flowers on the trained, as on the potted plants; the experiment was in the present season tried against a south wall in the Garden of the Society on two branches of the Large Quilled Orange, with great success; the branches so treated produced blossoms of an unusual size and expansion. In training the shoots to a wall, it is very desirable, if possible, to keep the branches of different lengths, so that the flowers which only grow at their ends, may not all appear as if at the extremities of the plant, leaving the middle destitute of blossoms.

In cultivating the Chrysanthemums as standards in an open border, it has been proved by experience, that few

* See Horticultural Transactions, Vol. v. page 572.

only of the kinds attain an appearance which can be considered as deserving notice, and the same kinds shew so much better against a wall, that the plan of growing them in borders has been abandoned in the Garden of the Society. When, however, the advantage of a wall is not to be obtained, and it is nevertheless desired to grow the Chrysanthemums abroad, the early and the hardy sorts, such as the Purple, Changeable White, Buff or Orange, and Rose or Pink should be selected, and a warm and well sheltered spot should be chosen for them.

XXXI. *Account of the Cultivation of* Chinese Chrysanthemums *in the Garden of the Horticultural Society. By Mr.* Donald Munro, *F. L. S. Gardener to the Society.*

Read January 17, 1826.

Since the first establishment of the Garden of the Horticultural Society in the year 1818, and more especially since its removal to Chiswick in 1823, considerable attention has been paid to the cultivation of the Chinese Chrysanthemums. An account of the practice which was in use in the year 1820 has been published* in the Transactions, but it has been so varied and improved upon, from time to time, that the present mode has now become entirely different from what it then was, and it seems therefore necessary to detail the system under which the plants are now exhibited in such a state of perfection, as even perhaps to rival their appearance in their native country. It is however but just to state, that the great improvement alluded to, is derived from the information communicated by Mr. Joseph Wells † to the Horticultural Society at the end of the year 1821. Fresh experiments will doubtless be made in this branch of gardening, for the Chrysanthemums have now become so essential to the perfection of a flower garden, that they will certainly henceforth attract the attention and care of all collectors and cultivators. The present mode may consequently in a few years become as

* See Horticultural Transactions, Vol. iv. page 352.

† See Horticultural Transactions, Vol. iv. page 571.

obsolete, as the former now has. Such as it is, however, I now lay it before the Horticultural Society.

In the beginning of April, a certain number of cuttings of each sort of Chrysanthemum in the collection, are taken for the supply of flowering plants for the ensuing season. The cuttings are taken from the top shoots of the last year's plants. The pots used for the cuttings at first are those generally called about London, small sixties. They are filled with mould made up of one-half equal portions of loam and bog-mould, and one-half sand. The cuttings when prepared, are about three inches long, they are inserted singly, one in each pot, and when all are potted, the pots are placed in a frame supplied with a gentle bottom heat. They are kept in the frame until they are well rooted, which usually is in about three weeks or a month. When the plants are fit to move, they are placed in a cold frame to harden a little before they are exposed in the open air; for this it is necessary to take off the lights in the day-time, and to close them again at night. About the beginning of June, the plants are shifted into fcrty-eight sized pots; they are then arranged in an open airy piece of ground, and watered with richly manured water, in which soap-suds have been mixed. The pots are never plunged in the earth, as it is found they do equally well without it, and when they are plunged in garden mould, the plants are continually rooting through their pots, and require to be moved every week or fortnight; besides, the quantity of mould in the pots is so small that it requires frequent watering, and when the pots are plunged watering is often neglected, and the consequence is that the shoots grow weak and small. After the second pottiug,

the tops of all the plants are nipped off to make them bushy, and when they put out fresh side shoots, no more of these are allowed to remain for flowering than the plants are likely to be able to support. In the month of August, the whole are shifted into thirty-two sized pots, which are afterwârds arranged in an open airy situation as before, at such distances as to allow the plants plenty of room to grow without touching each other's leaves. Here it is necessary that they should be frequently moved, in order to prevent the roots growing through the pots into the earth. It is also requisite that the plants be now tied up to sticks. The compost used in the last potting is strong loam, with about one-third of rotten dung. The pots are not taken under glass until they have formed their flower buds, and even until some of the earlier sorts are beginning to expand their flowers. In setting the plants in a glass-house, for shew, it is necessary to mix the varieties as much as possible. In the Garden of the Horticultural Society, the plants have been placed in a small curvilinear house fifty feet long, which holds about seven hundred pots at one time, there being no other plants but Chrysanthemums put into it at their flowering season, and at a moderate calculation, that quantity exhibited in the past season ten thousand flowers expanded at once. Some of the large plants which flowered the preceding season, of which a few are always kept over, produced about sixty or seventy flowers each.

It has not been the practice in the Garden of the Society to reduce the number of flowering buds, as recommended by Mr. Joseph Wells in his Paper above referred to; for although the blossoms on a plant so managed come somewhat larger, the effect of a greater number of flowers, though

smaller, particularly where the space intended to be filled is considerable, is preferable; when a small number of plants are kept, or when they are placed distinct from each other, or in a single row, then it is desirable to look to the size of the blossoms, in preference to their number.

We are much indebted to Mr. WELLS for his account of the cultivation of these plants, he has caused the saving a great deal of labour and expense, by bringing the plants to maturity from cuttings in the same season; perhaps the time of striking them proposed by him is rather too late, and the growing them under hand-glasses in a shady border is not always to be depended on, particularly if the season should prove unfavourable in consequence of cold, as it often does in the beginning of May; besides, the trouble of taking up, potting, and shading them until they recover, is considerable. When the cuttings are struck in small pots, their removal afterwards causes very little trouble, and they require no shading after potting, nor is any care necessary in doing it, for one man will re-pot a hundred small plants in an hour.

After all the cuttings that are wanted are taken from the old plants, they are turned out of their pots, the old mould is entirely taken away from their roots, and the suckers are rubbed off; they are then potted in forty-eight sized pots, and when they have filled those with roots, they are shifted into thirty-twos. In the month of August they are either put into twenty-four or sixteen sized pots, according to their size and vigour. They are generally kept with one stem, but sometimes three or four stems are allowed to rise; each of these is trained to a stick, and when the collection is

taken into the house for flowering, the large plants are placed behind the small ones, thus the size of their pots and the length of their stems are concealed from the view, whilst their superior height forms a good back to the whole mass of plants. It is to be observed, that the whole collection is not taken into the house at first, the late flowering sorts are placed in a covered pit, or frame, and are brought in as the earlier ones decline, thus a succession of varieties is kept up in equal perfection; and this makes it necessary, in order to have the house full to the end of the season, to keep in pots more than double the quantity of plants, including all the varieties, which the house will hold at one time.

XXXII. *Account of a Method of Forcing* Figs, *practised in the Garden of the* Earl of Harewood, *F. H. S. at Harewood House in Yorkshire. By* Joseph Sabine, *Esq. F. R. S., &c. Secretary.*

Read February 7, 1826.

With the assistance of Mr. Robert Chapman, the intelligent and skilful Gardener at Harewood House, I am enabled to lay before the Horticultural Society the following details of the Cultivation of the Fig in pots under glass, which has been successfully practised by him for the last thirty years in the Garden under his charge.

The pots, after the trees have perfected their crop in the autumn, and have dropped their leaves, are plunged in the earth in a fruiting house, where they are protected through the winter from severe frosts, and kept dry. In this state they remain until the time of forcing them arrives: this is the beginning of January. The trees are then taken out of the pots, all the younger roots are cut off with a sharp knife, so as to leave a ball of earth of a foot or fifteen inches diameter, according to the strength of the plant, round the older roots, and the outer mould is renewed, the plant being repotted in rich sandy loam. The pots used are large, and in proportion to the strength of the plant, the usual size being fourteen inches deep, and from twenty-two to twenty-four inches wide at top. A bed composed of horse manure, and oak or beech leaves mixed together, four feet broad,

and three feet and a half deep, is formed on the floor of a glass fruiting house, in the front part, and the whole length of the house; the pots are placed on the top of this bed in a row at such distances that the branches of the trees shall not interfere with each other. The house is seventy feet long, and eight feet wide, with fire flues in the back wall, on which Grapes are grown. The Fig trees occupy the front; a week or ten days after they are put into the house, the fires are lighted, and the temperature from fire heat is kept from 65° to 70° degrees of Fahrenheit. When the heat of the bed has moderated, that is, in about six weeks from the commencement, the pots are sunk into it up to their rims. The roots of the trees soon after this shoot through the holes in the bottom of the pots into the bed, which thus supplies great nourishment to the plants, and materially contributes to the advance of the fruit. The wood of the trees is frequently lightly syringed with water, until it begins to burst into leaf and to shew fruit; when the leaves are expanded, water is plentifully supplied, both to the pots and on the leaves. The fruit begins to ripen early in April, and a succession from the different kinds used, and by means of the second crop, is kept up in the same house until October. As the branches grow they are tied to stakes to prevent their intermixing with each other, and to keep them in their places, so as to derive the greatest advantage from the light and air. The sorts of Figs which are thus cultivated at Harewood, are the Genoa, the large Brown Ischia, the small Black Ischia, the Green Ischia, the Murry and the Black Genoa. The trees are of different ages, from three to twenty years.

XXXIII. *On the Cultivation of an Early and a Late Variety of the* Pear *on the same Tree In a Letter to the Secretary. By* Mr. Duncan Montgomery, *C.M.H.S. Gardener to the* Duke of Montrose, *F.H.S. at Buchanan, Stirlingshire.*

Read January 17, 1826.

Sir,

I submit to you what I have found to be a very beneficial plan in the management of Pear trees on walls. For twenty-four years and upwards, I have seen the practice of grafting old Pear trees growing against walls with various approved sorts on the same tree; in doing this the general method has been to cut off all the branches of the tree close to the trunk, except those intended to receive the grafts, and these are left about six inches long. I have also observed the system of side grafting, in order to fill the naked parts of the branches and other gaps in the trees.

These plans answer to a certain extent, but that which I have particularly to recommend is so useful that it requires only to be named to be generally adopted: it is to graft the half of the late Pear trees with the early sorts, and half the early trees with the late sorts; for instance, every alternate branch of the Crassane with the Jargonelle, and of the Jargonelle with one of the best late Pears.

The advantage of this plan in a small garden, where the walls are not extensive, is obvious; and even where there is a great extent of wall, when it is considered that it is mostly

the south exposure that is used for the produce of early and late sorts of Pears, in the climate of Scotland, the benefit is great.

By having the branches of Pear trees, alternately, one early the other late, there are as it were two chances of success; the Jargonelle being very early in blossom, if that fails in consequence of unfavourable weather, the late sort flowering at another time may succeed. Another advantage arises from the crop coming in at different seasons. The Jargonelle ripens off before much effort is required from the tree to support the late sort, so that the tree is more capable of supplying nourishment to half a crop of Jargonelles, than if the crop were all of that sort; and as the early Pears are all gathered before the late sort begins to swell to size, the tree is at once relieved from half its crop, and in that case more enabled to mature in greater perfection its late produce. My experience in the practice enables me to state that the trees produce finer fruit in this way than if they were all of one sort. If you think this Communication worthy your notice, I shall be gratified,

and have the honour to be, Sir,

your very obedient Servant,

Duncan Montgomery.

Buchanan,
December 31, 1825.

Note by the Secretary.

It is, as far as my observation has extended, very much the practice in Scotland to grow several varieties of Pears on the

same tree against walls. The necessity, caused by the climate, of training most of the Pears on warm exposures, has induced the adoption of this economy of wall room. It is however worthy of imitation in private gardens in England; for as few families can consume the entire produce of a full-sized well managed Pear tree of any one kind, much waste would be avoided, as well as more variety for the table secured, if every tree on a wall were worked with two or more kinds.

XXXIV. *On the* Transplantation of Plants with Spindle-shaped Roots. *By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read February 7, 1826.

It is a generally received opinion amongst gardeners, that plants with spindle-shaped roots cannot be advantageously cultivated by transplantation; and it cannot be questioned that the most perfect crops of plants of this habit, both in quantity and quality, will be obtained by permitting them to retain their first situation and position. But the value of every crop is rather to be estimated by the price it will make in the market, or the amount of convenience it will afford in a private family, than by its quantity, or quality; and consequently much may be advantageously sacrificed to obtain a crop at the period in which it is most wanted. I succeeded in bringing to my table, a crop of Carrots, in the last spring, nearly a month earlier than I could have done by the ordinary modes of cultivation; and as the same mode of management appears applicable to every plant of similar nature, and, as the process appears very unlikely to fail of success in the very worst seasons, I have thought it worth communicating to the Horticultural Society.

Pots of ten inches in width at the top, and of eight inches deep, were selected in the end of January, and filled to the depth of two inches with compost of the richest quality; and a smaller pot of nearly six inches deep, and eight wide, was

then placed to stand in the centre of each of the larger. The space between the circumference of the larger and smaller pots, was then filled with sandy loam of a moderate degree of richness, and in this, in circular lines, the seeds were deposited. The pots were placed in the cooler part of a stove (the unoccupied part of a hot-bed, or other situation of moderate warmth would have answered equally well) till all the seeds had vegetated; and the plants were subsequently protected from frost, and very unfavourable weather, by a glass light, till they were planted out in the beginning of April. When the plants were about to be removed, the smaller pots, which had executed the double office of giving the roots a direction more perpendicularly downwards, and of enabling me to convey water to the rich compost in the bottom of the pots, without moistening the loam on their sides, were withdrawn; and the roots were found to have reached and extended themselves greatly in the lower layer of very rich compost. The plants were then placed in shallow pans of water, and conveyed to the beds in which they were to be planted. Deep holes were made with a dibble to receive the roots, which were occasioned by the fluid, which adhered to them as they were individually taken from the pans of water, to hang perpendicularly downwards in the form of wet pack-thread strings; and they were thus made, without trouble, to descend perpendicularly and deeply into the soil. A mild and damp day was chosen, and a proper quantity of water given, and subsequently no further care or trouble was requisite. A few pots will be found to afford plants enough for a very large bed; and a common labourer, who is not accustomed to such business, will be able to

plant a couple of thousands in a day. In this, as in almost all cases where plants are placed in rows, it will be found advantageous to place the plants very near each other in the rows, with comparatively wide intervals between the rows. Four inches between each plant in the row, and a foot between each row will be found to be a sufficient and proper distance, and as the whole space of the beds will be fully and closely occupied, the weight of produce, comparatively with the extent of surface, will, I have good reason to believe, be generally found to be very great.

The same mode of management may, I entertain no doubt, be employed with much advantage in the culture of the different varieties of Beet; and, I believe, of the Swedish Turnep, whenever that is transplanted; for the mould will adhere much more readily to wet than to dry roots; and it is obviously advantageous that the roots of a plant, which cannot be regularly watered in dry seasons, should be made to descend deeply into the ground.

Fibrous rooted plants also, I am inclined to infer from the grounds above stated, will be found to succeed well under the same mode of treatment; for these would readily emit, in great abundance, new superficial roots. I am not however prepared to speak upon the evidence of any direct experiment.

XXXV. *First Report on the Experiments carried on in the Garden of the* Horticultural Society *of London, made up to the end of March,* 1825.

Read, February 7, 1826.

The following *Report* is that to which reference is made in the last Report of the Garden Committee, as comprehending an account of experiments conducted in the Garden of the Society to the end of March, 1825. It has been considered advisable not to extend this beyond notices connected with the Hot-houses and similar buildings constructed in the Garden: and to defer to future opportunities, a statement of the results of other experiments which have been instituted. The recent formation of the Garden, and the necessarily imperfect state, in so new an establishment, of most of the materials which are requisite for purposes of experimental investigation, have hitherto presented obstacles which each succeeding year may now be expected to remove; and as Reports are to be annually made on such experiments as shall be brought to a satisfactory termination, these will, in due time, be successively submitted to the notice of the Society.

Hot-houses. Of the houses in the Ornamental Garden department, two are constructed with wood; and one, which is double, that is, with a north and south aspect, is framed with iron. Those constructed with wood had been erected at

the late Garden of the Society at Kensington, whence they were removed when that Establishment was transferred to Chiswick. In their external structure there is nothing particularly novel to be noticed, but some observations on their interior may be useful.

Bark Stove. The small house which is used for the purpose of a Nursery Bark-stove, has its interior fitted up with a small tank for the growth of aquatic plants, a central brick pit for tan, an elevated border along the back wall for parasitical orchideous plants, and various shelves and stages of wood along the front and sides for smaller plants in pots. The roof does not rest immediately upon the back wall, but has a return to the north of about three feet, adapted to the purpose of ventilation without loss of light, the sashes being moveable on hinges. The plants in this house thrive exceedingly both in summer and winter, and in all respects it has been found perfectly suited to the growth of small plants of the more delicate kind from within the Tropics. The glass sashes to the north, alluded to, are found to be of great use in bringing the light nearer to the low plants cultivated in the border in the back part of the house.

Green-house. This, when fitted up, was designed for the reception of small plants in pots, before their being transferred to houses of larger dimensions. With this in view, and in order to bring the whole of the plants as near the light as possible, the back shelf, which is broad, was elevated nearly three feet and a half above the level of the front platform, and the intermediate space was fitted with two hollow stone stages, one rising two feet above the other, access being had to the back part of the house by means of stone steps at each end of the

central stages. The front and sides were furnished with open wooden shelves for plants in pots. The roof rests immediately upon the back wall, and in no case is more than five feet from the stages upon which the plants are arranged. In the summer, plants thrive well in this house, especially those of a bulbous nature, and from temperate latitudes; but not being capable of receiving sufficient heat from the sun's rays, it is not adapted for the protection of tender or delicate plants. In the winter, plants are not so healthy in it as could have been wished, a circumstance which it is supposed may be attributed to the dampness of the brick work, and stone shelves of the interior, the ill effects of which are not sufficiently counteracted by the operation of light and heat. So much timber has been used in the construction of the roof, that it has been calculated that about one-third of its whole breadth is opaque. The building was originally constructed at Kensington on very cheap terms, as a temporary protection for Chinese plants, and it would perhaps have been the best policy not to have removed it, but to have constructed a house on a more improved plan instead.

Protecting Pits. Both these last mentioned houses have a brick flue passing along and close to the front wall, from which a sufficient heat is imparted to small pits built in front, to maintain their temperature at a degree which is high enough for the preservation of bulbous and half hardy plants during the winter, and with the aid of a mat in very severe weather, to exclude frost during our coldest winters. The hinges of the sashes on these pits have been contrived by Mr. William Atkinson, to whose advice and assistance in the construction of the buildings in the Garden, the Society is much

indebted, in such a way as to render it easy to lift the sashes out of their frames when it is wished to remove them. This is effected by the pin of the hinge being screwed on the side of each end of the sash, and falling into a corresponding half circle of metal in the frame of the sash. This method is found extremely useful, and not at all liable to be deranged either by use or neglect.

Curvilinear Houses. These Houses are formed with curvilinear bars of wrought iron resting in front upon the plate of a low wall, and at back against the face of the back wall. They are built as two distinct houses, the one facing the south, the other the north. That to the south is fitted up withinside with a stone shelf on a level with the wall-plate, running along the sides and front, and a hollow chamber, over which is a sand-bed, heated by an internal flue along the centre. No tan is used in this house. The back is without shelves, but several niches have been contrived in the wall which receive the half of as many large pots, in which are planted trees trained to a trellis, over the whole back of the house. Wires are also fixed to the roof from front to back, and from end to end, for supporting climbing plants. The north house, which was designed as a propagating house, has a stone shelf at the back, and a hollow chamber with a sand-bed over it in front, and is heated by a single flue, which, entering at the front, runs through the interior of the chamber, and, imparting a certain degree of heat to the sand-bed above the chamber, returns by the back. The two ends of this last house are not glazed, being of brick work. In remarking upon these houses, much pleasure is felt in being able to state that, as far as experience in them has gone, their

value as protections for plants is not inferior to the elegance of their appearance. In the south house, various kinds of Tropical fruit trees have been planted, and among them have been mixed other plants from similar climates, and requiring similar treatment. These have grown with a vigour and healthy appearance far beyond what has been remarked in any wooden hot-houses which have come under observation. Several, such as Guavas, Eugenias, &c. have already produced their fruit upon very young trees, and good promise is offered of their being followed by other plants yet more difficult to fruit. This must, it is believed, be attributed to the abundance of light afforded to the plants, and to the effect of the solar heat, which is more abundantly admitted by the great extension of the glass, and which renders it practicable to maintain the atmosphere in a much more humid state than in darker houses. The whole loss of direct light in the curvilinear iron houses cannot be estimated at more than one twenty-third, while in the common stoves it is never less than one-sixth, and sometimes as great as one-third. During the time to which this Report extends, that is the two years since these houses have been built in the Garden, the unusual mildness of the winters has prevented any observations being made upon the effect of severe cold upon them. It may be remarked however that in the summer, heat is transmitted through the glass and iron bars in a space of time inconceivably small. Those persons, however, who are best acquainted with the management of iron houses, do not fear that, though the same causes will, in hard frosts, occasion the internal heat to be given out to the external atmosphere, in a corresponding ratio, the proper management of the

fires will be able to maintain such a temperature as is requisite.* The only weather which was sufficiently severe to produce any perceptible effect upon the plants inside either these houses, was in the beginning of 1823, a few months after they were built. At that time, the thermometer was not at any time in the open air more than a very few degrees below the freezing point; but this slight degree of cold was accompanied with a strong north wind; and then it was found impossible to keep the frost out of the north house without covering the outside with mats. At that time however the laps of the glass were not puttied, which made the external covering necessary. The remedy of closing the laps with putty, was immediately and successfully applied. It must not be forgotten, that the above remarks apply to Curvilinear *Stoves* only; with respect to *Green-houses* constructed with iron, the Garden of the Society at present affords no evidence.

Forcing Houses In the Experimental Fruit and Kitchen Garden, two small Glazed-houses have been erected, the one a Curvilinear Iron-house, the other a wooden Peach-house.

Peach-house. No observation can be made respecting this house until the trees, with which it is planted, shall have arrived at a bearing state. It is constructed more for the purpose of exhibiting and comparing varieties of the Peach and Nectarine, than for the production of early or large crops.

Curvilinear Fruiting-house. Upon this house several observations have been made which deserve attention. It was contrived for the purpose of forcing fruits in pots. In its internal arrangement, it is somewhat the same as the south

* February, 1826. The experience of the past winter has fully justified this opinion.

curvilinear plant-house before described, that is to say, it has a sand-bed in the middle, stone shelves along the front and ends, and niches in the back wall: these last are used for the reception of fig-trees in pots. The sand-bed, however, is not placed over a hollow chamber traversed by a flue, as in the house in the Ornamental Garden, but is of stone raised upon piers with a flue running below it, which consequently is open to the whole house. The house is ventilated, not only by means of apparatus in the front and back walls, but the two ends of the house are so contrived that they will open almost entirely when necessary, so that a current of air may be introduced both from the ends and sides. In the first year of its trial, the roof was permitted to be wholly exposed to the action of the sun, but it was found impracticable to regulate its temperature under such circumstances. The temperature indeed was kept equal during the night by means of fire-heat without difficulty, but in the day-time it was impossible to do so. When there were alternate changes from a clouded to a bright sky, the action of the sun's rays was so sudden, that the temperature of the house was raised too high before the speediest supply of air could be given; and when there was a whole day of continued sunshine, with a calm atmosphere, as often happened in the early part of the season, the house could not, with all the ventilators in operation, be kept within ten degrees of the temperature required for Cherries, or even Peaches. When, on such days, Cherries were in full flower, the foot-stalks of their flowers became withered, and never afterwards recovered. Strawberries produced an abundance of fruit, and Figs as much as could be expected in their first season. After this

experience, it was determined to counteract the irregularity of temperature by providing the roof with an awning of canvas, which might be drawn over the glass or removed, as should be advisable. This produced very beneficial results. Peaches and Nectarines appeared to sustain less inconvenience from the nature of the house. Plums, Apricots, and some other more hardy fruits have succeeded better, but Cherries have continued to resist the attempts which have been made to force them in it. The experiment therefore seems to prove, that, although with attention it may be practicable to force some descriptions of fruits, such as Peaches, Nectarines, Figs and Strawberries, perhaps with almost as much success as in a wooden house, yet that others are not to be made to bear their fruit, and that upon the whole, a house constructed with wood is much better adapted to the purposes of forcing, than one with a curvilinear roof of iron.

Ventilation. After having said thus much of the hothouses in the Garden, with reference to their internal arrangements, it may be proper to offer some remarks upon the manner in which they are ventilated. Not that the mode in which it is effected, is either absolutely new, or not known to many of the Fellows of the Society, but because the method is not so much adopted as it deserves to be; and because the advantages which have been experienced from it deserve to be generally made known upon the authority of the Society. The way in which it is effected, was, it is believed, first practised by Mr. Atkinson, who introduced it into the construction of vineries with good effect. The contrivance is this.—In the first place, the roof is not provided with moveable sashes, but they are, on the contrary, fixed: there

is necessarily no upright glass in front of the house; but the roof rests there upon the solid wall, and at back upon the face of the back wall. In the front wall are built a number of wooden frames, into which shutters opening externally on hinges, are accurately fitted. In the back wall within the house, and next the glass at top, are also fitted a corresponding number of wooden frames furnished with a wooden slider, running up and down by means of pullies with cords and weights, after the manner of a window-sash. These sliders are interposed before a hollow in the wall, which communicates with the external air in front above the glass roof of the house. When it is wished that no air shall be admitted, the front shutters and the back sliders are closed, and in proportion as it is desired to ventilate the house, are they opened to a greater or less degree. By these means a current of air is maintained from front to back; and as fast as the admitted air becomes heated, and rises in the house, it escapes through the ventilators at the top of the back wall. When it is expedient to admit fresh air, without loss of much heat, the front ventilators alone are opened. The ventilation of the houses being thus effected with facility and accuracy, renders the moving the lights for that purpose unnecessary; and, in consequence, all the sashes in the Houses erected in the Garden of the Society, excepting those of the Peach-house, are now fixed. By aid of these ventilators, the temperature of iron houses is capable of being lowered in the hottest days of summer to a degree even inferior to that of the external air. The advantage in obviating the wear of wood-work, and the breakage of glass, is manifest. The ventilation of the house for forcing Peaches and Nectarines is also provided

for, on the same plan as in the other houses; but the lights are not fixed, because it is necessary for the perfection of these fruit, both as to their colour and flavour, that they should be exposed to the direct influence of the sun without the intervention of glass, in the last period of their ripening. These lights therefore have not been fixed, in order that they may be taken off at the requisite time.

Humidity in the houses. Some observations have been taken with Mr. Daniell's Hygrometer, upon the state of the atmosphere in hot-houses; the result of which seems to be this. That in curvilinear houses during the summer, the degree of atmospheric moisture, which appears to be most suitable to Tropical vegetation, may be settled to be about .860, the temperature being from 80° to 87° Fahrenheit, and the transmission of light such as has been already stated to take place through an iron roof. And it has been satisfactorily ascertained, that the nearer the temperature and humidity of a stove, approximate to these degrees, the more favourable is the artificial climate found for bringing the powers of vegetation into vigorous action. It can also be stated, that unless such a degree of humidity is carefully maintained during the summer months in a hot-house constructed of iron, such a house will be found more rapidly prejudicial to the health of plants, than one constructed of wood, because its atmosphere if left to itself would become more dry, and the plants would exhibit all the symptoms consequent on aridity.

Plant-pits heated by dung. In the Ornamental Experimental Garden is a triple range of brick pits, heated externally with dung, these have been erected upon a plan

recommended by Mr. SAMUEL BROOKES of Ball's Pond, for the purpose of receiving such plants or seeds as require the heat of a dung-bed during the summer, and especially as a nursery for Tropical plants after their arrival from a long voyage. These pits are thus constructed. Upon three parallel equidistant walls, built with pigeon holes, and crossed at intervals by other walls acting as tyes, is placed a flooring of strong slates. A single course or more of bricks is laid over the slates in front, and at back in like manner is placed a slight wall higher than the front wall by one course of bricks. Upon these upper walls is fixed a common garden frame. Dung is applied to the faces of the walls constructed with pigeon holes, as in a common brick dung-pit. This is found economical in the consumption of dung, and beneficial to the plants, by keeping them in a regular degree of warmth and moisture, without the inconvenience of the unwholesome steam from the dung being admitted among them. These pits have answered their purposes perfectly well, except during the winter season; at that period they are inconvenient on account of dampness, and it has been found difficult in very cold weather to keep so high a degree of heat in them as is sometimes desired.

MELON AND PINE-PITS. The following pits have been erected. Two Melon-pits upon the plan of M'PHAIL; two Melon-pits upon a plan proposed by Mr. ATKINSON; two Pine-pits upon what is usually called Mr. BALDWIN'S plan; one Pine-pit upon Mr. SCOTT'S plan, as detailed in the Transactions of the Horticultural Society;* and one Pine-

* Horticultural Transactions, Vol. v. page 220.

pit upon the plan of Mr. BUCK, as also described in the Transactions.* There is also a small stove for the purpose of fruiting the smaller kinds of pines.

Scott's and Buck's Pine-pits. Of the pits constructed upon the plans of Mr. SCOTT and Mr. BUCK, ample information has been given in the descriptions above referred to. The first of these is constructed so that the heat of fire and dung may be separately or jointly applied to the plants; the other is warmed by fire alone; but both are designed to allow the whole space of the pit under the glass to be occupied with the plants, the flues being removed without the body of the pits, and yet affording all the heat required. The pines grow perfectly well in them; their construction is however costly, and some inconvenience attends the shifting the plants which are kept in them. A considerable difficulty also is consequent on the situation of the flues, when it is necessary to get at them, for the purpose of cleaning or repairing them.

Small Pine-house. Of the small brick stove for fruiting pines, there is not any thing remarkable in the construction. It is ventilated from back to front as the large houses, and the lights remain, unmoved, except when it is required to change the tan, or to alter the general arrangement of the plants. It has a walk at the back, which is of course convenient for the purpose of inspection, though of little use to the cultivation. This house was intentionally constructed of small dimensions. An enlargement of the plan in every direction would form a better house for ordinary purposes.

* Horticultural Transactions, Vol. iv. page 533.

M'Phail's Melon-pits. The Melon-pits upon the plan of M'PHAIL, were constructed in the Garden in two ways. In the first, the original plan of M'PHAIL was exactly followed: flues were built across the pit under the rafters, as well as round the sides, and covered with flue-tiles. In the other, the original plan was deviated from by the omission of the cross flues; the flues being built round the outer wall only; they were moreover covered with slates. This was done with a view to diminish the expense of constructing the pits, and at the same time for acquiring a greater space for earth. The following observations have been made upon their respective heat. On the 26th February, 1824, the temperature of the external air being 46°, the naked bulb of a thermometer was applied to the tiles, and it rose in three minutes to 64°; but applied to the slates, it rose in the same space of time, and under the same circumstances, to 69°. On the 3rd of March following, the whole of the lining of both pits having been renewed a short time previously, a similar experiment was made, but in a more perfect manner. The temperature externally was 37°. In one hour and a half, thermometers placed in the pits at the same moment were examined, and found to be in the pit with slate-covering to the flues, 82°; and in that with tile-covering, 72°. It therefore appears that by using slate as a covering to the top of flues in such pits, a greater degree of heat is obtained at a less expense of building and space. The contrivance of these pits is, however, under the best construction, clumsy, and much inferior to that next to be described.

Atkinson's Melon-pits. It has been already stated that two Melon Pits were built upon a plan proposed by Mr.

Atkinson. These have been found far superior to any other yet constructed. The principle is that of a brick pit heated by dung, and consists of four external walls, of which the back and sides are four inches thick, and built in the pigeon-hole manner. The front is a hollow fourteen-inch wall open at top within side, and externally formed with a thin panel of slate in one case, and of thin bricks set on edge with cement in the other case. Against these walls the dung is applied as usual, by which means dry heated air is communicated to the pit from the front, and the damp warmth from the steam of the dung penetrates the Pit at the back and sides. This contrivance is simple, and free from the objectionable points in the M'Phail's Pits, especially in being much less expensive, and more roomy. If it were intended to apply the principle to the construction of a Pine pit, it would be necessary to enlarge the dimensions of the pit, and advisable to add a hollow flue against the face of the back wall, by means of small plug-holes in the upper surface of which, steam from the dung could be admitted to the interior atmosphere whenever necessary. It should be remarked, that in these pits a contrivance was attempted for admitting fresh air in a heated state through a flue communicating at the one end with the external air, and at the other with the lower part of the cavity of the front hollow wall of the Pit. The advantages attending this contrivance were not such as were anticipated, and as it added materially to the cost of the pit, it has not been noticed here as essential to the plan. It has been already stated, that these Pits have heat conveyed to the inside in front by means of thin panels, of two kinds, the one made of slate, the other of thin bricks set on edge in cement. This

was done with a view to ascertain what the differences were of the conducting power of slate and bricks, and whether the difference, if any, was such as might be considered equal to the extra cost of the slate. On the 3rd of May, 1824, two thermometers were suspended in the cavity, the air of which is heated by the medium of the above described panels, the external lining of dung having been recently renewed. After remaining suspended for an hour and an half, the thermometers were examined, and it was found that the heat of the air in the cavity, warmed by the intervention of the slate panel, was 89° ; of the brick panel, was 92° ; making a difference of 3° in favour of the least expensive material.

Baldwin's Pine-pits. The two Pine-pits upon the plan of Mr. BALDWIN are, in all respects, such as are usually constructed, but with this exception, that the walls, instead of being built with pigeon-holes, have passages for the dung-heat left by the omission of the mortar in the side joints of the bricks. This has been found a more regular mode of admitting the dung heat than that usually adopted, and also a more effectual method of excluding vermin from the inside, but it has the disadvantage of not allowing a sufficiently quick transmission of steam and heat. The dung-pits are covered externally with sloping wooden lids, resting upon a frame-work of wood ; these cause the dung to retain its heat for a longer time than when it is exposed to the weather, and they give a degree of neatness to the Pit which can never be maintained when dung is exposed.

XXXVI. *On the Cultivation of the* Passiflora Quadrangularis. *By Mr.* William Mitcheson, *Gardener to* John Milford, *Esq. F. H. S.*

Read October 18, 1825.

My practice in the cultivation of the Passiflora Quadrangularis, or Granadilla, for fruit in a stove, differing in some respects from that published by the Horticultural Society in their Transactions* sometime since, I am induced to submit the consideration of it to the notice of the Fellows of the Society.

With me the Granadilla is planted in a box or tub of about eighteen inches square, which is fixed at one of the angles of the tan-pit, on brick or stone work, to prevent its sinking. In the sides of the box are bored a number of holes about one inch in diameter, to admit the roots to run amongst the tan, which they must be encouraged to do as much as possible, and which they will freely do if supported by frequent watering. The plant is trained with a single stem till it reaches within a foot of the glass, and is then stopt to induce it to throw out separate shoots, which should be trained to four or more rods or wires fastened to the rafters, at about a foot apart, and from a foot to eighteen inches distance from the glass. The shoots are trained to the right and left, three each way, and the laterals of each shoot are trained to the same wire with their principal shoot.

* See Horticultural Transactions, Vol. iv. page 60.

In autumn the shoots are pruned back to within two or three eyes of the old wood, and in March following, or just before the plant begins to break, it is taken up, and the roots are cut away, so as to reduce the ball to about a foot in diameter every way. It is then replanted, the box being filled with fresh compost. The cutting the roots gives a temporary check, but the plant acquires subsequent strength from the operation.

When in bloom, and also when the fruit is swelling, an ample or rather a copious supply of water is given. I have found this supply of water at the flowering season so beneficial to the plant, as to enable it to set its fruit without artificial impregnation, though in dull weather, and when little air is admitted to the house, it is certainly the safest method to assist the setting by that means; but, I have never observed any inconvenience to arise from the decay of the rays or other parts of the flower at the base of the column, which supports the germen after the impregnation has been properly effected.

When a plant has been established one or more years, it will generally begin to ripen its fruit in the end of June, or beginning of July, and will continue to bear in regular succession till near Christmas. A strong plant will produce as many as forty fruits, and I have gathered that number in a season; but to have them large and fine I prefer taking a less number, considering from fifteen to twenty a sufficient crop.

XXXVII. *On a Method of Growing* Asparagus *in single* Rows, *as practised by Mr.* Walter Dickson, *at Redbraes, near Edinburgh. In a Letter to the Secretary. By Mr.* Andrew Dickson, *F. H. S.*

Read March 21, 1826.

Sir,

Mr. Dickson's method of growing Asparagus in single rows, of which you have requested an account, is so simple, that little explanation will be required. It occurred to him that planting Asparagus in single rows, particularly in the soil of his Garden, (which is a light black earth upon a subsoil of sand) might answer much better than in beds, as it would enable him to introduce manure to the roots, by pointing it in between the rows with the spade. He had observed that the usual mode of dressing Asparagus beds by a covering of dung in winter on the surface was apt to produce canker, and that consequently many of the plants in the beds came up sickly and weak in spring, and ultimately decayed during the summer. The first plantation he made in single rows was in our Leith Walk Nursery upwards of twenty-five years ago, and this yet retains its vigour and produces fine heads. This I think you did not see when you were at Edinburgh, otherwise you would have noticed he had erred in not giving sufficient room between the rows, which are only two and a half feet apart.

The plantations he has since either made himself or re-

commended others to make, have been at three and a half feet distance row from row. The plants are planted at nine inches apart in the rows; the ground has no further preparation previously to planting than being dug or trenched to its full depth, and well manured with rotten cow-dung. The young plantation you saw at Redbraes, has only been made two years, and was so strong as to admit of being partially cut the second year. Mr. Dickson prefers planting in July to spring, and with seedlings of the preceding season. I venture to give it as my opinion, that the produce from two single rows planted in the way described, will both in quantity and quality (but particularly the last) be found superior to three rows of equal length planted in beds in the usual way; the ease and facility with which the heads are cut is likewise in favour of the row system. I may further add, that in our northern climate, it is of moment that the plants should have all possible benefit of the sun's rays, that the roots may be well ripened and prepared to shoot vigorously in spring; and I need not point out to you that this will be better obtained by the plants growing in distant rows, than when they are crowded in beds in the usual way.

I am, Sir,
Your very obedient servant,
Andrew Dickson.

Edinburgh,
12th March, 1826.

XXXVIII. *Notice of* New or Remarkable Varieties of Fruits, *ripened in the Summer and Autumn of the Years* 1823 *and* 1824, *which were exhibited at Meetings of the* Horticultural Society.

Strawberry.

Mr. John Wilmot, F. H. S. sent to the Meeting on the 6th of July, 1823, specimens of a new Strawberry, which has been named *Wilmot's Superb*, raised by him from seeds of the true Chili, impregnated by the pollen of the Roseberry. It is of very large size; the first fruits are usually of the cockscomb shape; the colour is a little darker than that of the Old Pine; the seeds are numerous and prominent. The flesh is stained with red throughout, but is whitish at the centre, where there is a small hollow; it is buttery and rich with a pleasant acidity. The plant is large, tall and vigorous, bearing its fruit high from the ground. This variety has been already described in the account of Strawberries* cultivated in the Garden of the Horticultural Society, and is here noticed for the purpose of illustrating the annexed figure† of it, (Plate v.) from a drawing by Mr. Charles John Robertson.

* See page 208 of this Volume.

† From a duplicate drawing by the same artist, Mr. Wilmot has caused another engraving to be made, conceiving that the publication of it would make the fruit more generally known. The Council of the Horticultural Society were not aware of Mr. Wilmot's intention until the present plate had been engraved, but as Mr. Wilmot's figure is not attached to any work, consequently not likely to be equally permanent, it was thought right not to withhold the print.

Wilmot's Superb Strawberry

Plum.

Nicholas William Ridley Colborne, Esq. F. H. S. on the 27th of September, 1824, sent from his garden at West Harling in Norfolk, two specimens of Coe's Golden Drop Plum of different colours borne on the same branch: one was of the usual colour, the other violet. The fruit of the latter was perfectly formed, and the branch was in good health, so that disease had no share in producing the change; its flavour was precisely that of the yellow variety. Mr. Ridley Colborne subsequently sent the branch to the Garden of the Society, where it was grafted, with the view of ascertaining whether the sport will be permanent or not.

Apricot.

Mr. Alexander Richardson, Gardener to the Countess of Tankerville, at Walton on Thames, sent to the Meeting on the 2nd of September, 1824, specimens of a seedling Apricot, the produce of a standard tree, raised from a stone of the Moor Park, and growing in Lady Tankerville's Garden. The variety very much resembled the Moor Park, but appears to be more hardy, since it ripens quite well on a standard, and attains to a larger size. It has been named the *Walton Moor Park Apricot.*

Peaches.

George Robert Goodin Ricketts, Esq. F. H. S. sent on the 20th September, 1823, specimens of a Peach raised from seed by Mr. William Holmes of Twyford, near Winchester. It closely resembles a Noblesse, is well shaped,

and very excellent both in colour and flavour. It has been named the *Twyford Peach.* The stone from which this peach-tree was obtained was sown in 1817, and the plant in the fourth year after produced its fruit.

Mr. Stephen Hooker, F. H. S. sent on the 10th of October, 1823, specimens of a Peach, the produce of a standard-tree growing in a court-yard adjoining the house of Mr. Ware, in the town of Tonbridge. It is of good size, round, deeply cleft, a rich yellow on the shaded side, and very deep red where exposed. Flesh yellow, red at the stone, hard and adhering firmly; very rich and highly flavoured. It is a remarkably hardy variety, and will no doubt ripen earlier if grown in a more favorable situation than that in which Mr. Ware's tree is placed. The tree is sixteen or seventeen years old, and has never been transplanted. It began to bear when six or seven years old, and has continued to produce abundantly every year since. It has been named the *Tonbridge Peach.*

Nectarines.

Specimens of the *Boston Nectarine* were received from Thomas Andrew Knight, Esq. the President, on the 18th of July, 1823. The original tree was raised at Boston in the United States, by Mr. Lewis, of that town, from a stone of a Peach. Plants of it were presented to the Society and to the President by Samuel G. Perkins, Esq. of Boston, a Corresponding Member of the Society. The fruit is of the middle size, nearly heart-shaped. The skin, where shaded, is bright yellow, deepening from slight mottling to intense red as it is more exposed; its appearance is very beautiful. The flesh is a rich orange colour, having no mixture of red; it parts

freely from the stone (which is small and pointed), is rather firm, not remarkable for its sweetness, but has a peculiar flavour, which is very pleasant. As Nectarines are but seldom raised, and little cultivated in the United States, the original production of this variety was considered worthy of record and notice.

On the 16th of September, 1823, Mr. KNIGHT sent specimens of a new Seedling Nectarine of large size, marked No. 6. The shape of the fruit is rather more globular, and its colour deeper than that of the Elruge Nectarine; the flesh is pale yellow, red at the stone, which is small in proportion to the size of the fruit. The skin peels off freely, the flesh is soft, full of juice, rich, and sweet. Mr. KNIGHT states that these Nectarines ripened several days before the fruit of either the Violette hâtive or the Elruge, and that they had the property of being so firmly attached to the stalk, that they did not drop off, but all remained on the tree till they shrivelled. In reference to this circumstance it has been called the *Imperatrice Nectarine,* the Plums with that name having the same property.

PEARS.

Captain PETER RAINIER, F. H. S. sent, on the second of November, 1823, specimens of a seedling Pear of considerable excellence. It resembles the Easter Bergamot in shape and colour, but is melting, with a little grit at the core. It ripens in the beginning of November, is rich, sweet, and pleasantly perfumed, and is an excellent bearer. It was found growing wild in the neighbourhood of Southampton, by the late BRYAN EDWARDS, Esq., and was removed into his garden. It has been named *Bryan Edwards's Pear.* The original

tree is growing as a standard in an open quarter, and is so hardy in its blossoms that it produces a crop even in an unfavourable season. Its fruit does not ripen on the tree, but probably would do so on a wall, as it only requires to be kept a week or ten days after it is gathered, before it is fit for the table.

Messrs. GEORGE and WILLIAM TINDALL, of Beverley, in Yorkshire, sent to the Meeting on the 20th of January, 1824, specimens of a new variety of Swan's Egg Pear, which is stated to succeed well in that neighbourhood. It is larger and browner than the Common Swan's Egg, and equal to it in flavour. It keeps well till the end of January, and sometimes later. It has been named *Tindall's Swan's Egg*. Plants of the variety have been subsequently presented to the Garden of the Society by Messrs. TINDALL, from their Nursery.

A plant of the *Sha Lee, or Sand Pear* of China, was introduced by the Horticultural Society from China, in the Spring of 1820, on board the Cornwall, Captain JOHN PETER WILSON. A graft of it having been sent to the President, was placed by him on an old Pear-tree against a south wall in his garden at Downton, and it produced fruit in 1823. On the 17th of November in that year, a specimen was sent by Mr. KNIGHT to the Society; it was near three inches long, and two inches and a half in diameter in the middle, and nearly equal at both ends, forming almost a perfect oval. The stalk was unusually long, the eye small, close, deeply sunk; the skin pale dull yellow, covered with numerous rough brown spots; the flesh white and crisp, with the flavor of an apple rather than of a pear, and of no particular excellence. The tree appears to be a distinct species, but

nearly related to the Pyrus Communis; it has been named by Mr. LINDLEY Pyrus Sinensis. It is very different in appearance from any variety of the Common Pear. The leaves are almost ever-green, continuing on the tree nearly the whole winter; they are large, and shining dark green. The tree vegetates very early in the spring; when it is easily recognized by the brown colour of its young leaves and shoots.

XXXIX. *Report upon the* Meteorological Observations *made in the Garden of the Horticultural Society, during the Year* 1825.

Read February 7, 1826.

THE Garden Committee having, on the 28th of February, 1825, resolved that it was expedient that a Meteorological Journal should be kept in the Garden of the Society, a plan for carrying this resolution into effect was prepared, and some instruments were procured in time to commence the observations on the 1st of the following May. From the difficulty, however, of obtaining efficient instruments, the tables of observations, up to the end of 1825, are not in a state sufficiently perfect to justify their publication. The present Report, therefore, is made only with the view of offering a few remarks upon the state of the atmosphere during one of the driest summers which has been experienced in Great Britain for many years.

From the 1st of January, 1826, the Journal of Observations has been carried on with instruments of the most perfect construction, and on a more enlarged plan than that first prepared. For a detailed account of this plan, and of the instruments employed, as well as for an explanation of the nature of several of the observations, particularly of those relating to humidity and radiation, reference may be made to a succeeding Report which will detail the plan to be pursued and the instruments to be employed in conducting a course of Meteorological Observations in the Garden.

In the beginning of *May* the weather was cool for the season, the thermometer, during the first fortnight, rarely indicating more than 64° at noon, and being as low as 48° and 50°. At this time a good deal of rain fell, but towards the end of the month the weather became fine, and the thermometer at one time rose as high as 76°. The mean degree of moisture was .840, and the least degree of moisture .427. The amount of rain was 2.90 inches, and the prevailing winds were southerly, having been in that quarter 14 days out of 31.

In *June* the weather had become much warmer, and was upon the whole very fine; the thermometer was frequently as high as 78°, and once 81°, at noon, and at night seldom lower than from 57° to 63°, so that the nights of this month were as warm as the greater part of the days of May. The lowest point to which the thermometer fell was 46° on the morning of the 22nd. Very little rain fell except in the beginning of the month, in consequence of which the atmosphere became so dry that the mean degree of moisture was not higher than .792, while it was observed, on one occasion, as low as .389, and towards the end of the month the dew point at noon was frequently much higher than 20°; on one occasion it was observed as high as 28°. The wind was not in the north for a single day, and in the N. E. only 3 days.

July was remarkably hot and dry. During the whole month there fell only .05 inch of rain. The mean humidity of the atmosphere was not so high as that of June by .067, amounting on the whole to only .725; but no single observation during the month indicated a much lower degree of moisture than was noticed in June. The thermometer was

frequently observed as high as 90° in the shade, and twice as high as 95° between 2 and 3 P. M. At 9 P. M. it was several times as high as 75°, and on no occasion was ever lower than 48°. Notwithstanding this heat, the wind was not due south for a single day. After the 20th the wind was northerly, and the nights became colder.

In *August* the weather was occasionally showery and cloudy, and during the month 2.03 inches of rain fell. The wind was chiefly westerly. The mean degree of moisture increased to .857, but on one occasion the air was noticed to be as dry as .359, a state in which it is seldom found in this country. This was at noon on the 9th; the thermometer at 69° in the shade, with a very slight breeze from the west. The difference between the temperature in the shade and under the influence of the solar rays, was, on the 20th at noon 40°, the shade being 70°, and the sun 110°. The greatest degree of terrestrial radiation was indicated by the radiating thermometer to be 41° on the first day on which the instrument was used.

In *September* the weather became more unsettled, 12 days during the month being more or less rainy. The amount of rain was however inconsiderable, being only 2.31 inches. The early part of the month was hot and very fine; that part during which the rain fell was very sultry, the thermometer being usually about 70° in the shade at noon, and ten or fifteen degrees higher in the sun. The mean degree of moisture was .863, which was a little higher upon the whole than in August, but no day was found to be drier than .537, which was a material increase of humidity beyond that of August. The highest degree of heat which the thermometer

indicated in the shade at noon was 78° on the first of the month, and 108° in the sun.

In *October* the heat and dryness of the previous season had entirely passed away, and was succeeded by cold unsettled weather during the whole of the month; notwithstanding the wind was for the most part in a southerly direction, the mean degree of moisture was found to be as high as .906, and the least which was observed was .658. The amount of rain was 2.40 inches. The greatest heat was 69° in the shade, and 82° in the sun at noon, while the thermometer was one day as low as 43° in the shade: it was remarked however to be 71° at the same time in the sun; so that while with a temperature of 69°, the amount of solar radiation was only 13°, it was with the low temperature of 43° as much as 28°. Two nights only were frosty, each being 30° against a wall, and 28° according to the radiating thermometer. The common range of the thermometer at night was between 34° and 42°.

November was cold and unsettled, with frequent frosts at night, the thermometer having indicated a temperature lower than 32° for 15 nights. On the 12th it was as low as 23°. The days were also cold, the thermometer usually ranging in the shade at noon from 45° to 50°; in the sun however it was at three several times higher than 70° at the same time; but the mean temperature was only 42°. The atmosphere was in a high state of humidity, the mean degree of moisture being .921, and the least degree .714. The amount of rain was 2.83 inches.

December was milder than November till the 27th, when a sharp frost set in; up to that time there had been only 4 frosty nights. The mean temperature was 41°.2. The mean

degree of moisture was .959., .038 higher than in November, but the air was at one time observed as dry as .707. The highest temperature in the sun was 62°, and in the shade 55°; the lowest at night was 26°. A slight fall of snow took place on the 27th, but up to the end of the year the quantity that fell was very inconsiderable. Nine days only were wet, and the greatest quantity of rain was 1.73 inch.

XL. *Method of Cultivating the North American and other hardy* Orchideous Plants. *In a Letter to the Secretary. By Mr.* Stewart Murray, *Corresponding Member of the Horticultural Society of London, Curator of the Botanic Garden at Glasgow.*

Read February 7th, 1826.

Sir,

I have much pleasure in complying with your request, that I would communicate to the Horticultural Society a description of the mode I have adopted in this Garden for the cultivation of hardy *Orchideous Plants,* which you appeared so much to approve, when you visited Glasgow last autumn.

About the middle of February last, I made choice of a well sheltered border, nearly the lowest in the garden, and facing towards the south. The original soil was first taken out to the depth of sixteen inches, and a wooden frame fixed in the border; this was twenty-two feet long, nine feet and a half wide, two feet and a half high at the back, and fifteen inches high in front. Moveable glass lights were fitted to cover it. The inside of the frame was then filled to the ground level, with a compost made of the following materials: one-third of leaf mould, one-third of turfy peat recently taken from the moors and partly full of the roots and stems of the common heaths; the remaining third was composed, half of Sphagnum and half of sand. The whole was well broken and mixed together, but not riddled. The roots were then

planted, and some care was taken to keep the surface a little higher for those kinds which require less moisture, such as Cypripedium arietinum, and others. A regular supply of water was constantly given to the plants as required. In hot weather, a partial shading was laid over the glass during the forenoon, sufficiently thin, however, to admit of the temperature under the glass being raised to something like that of a North American summer, by the influence of the sun. Attention was also paid to the admission of air, so as to prevent the plants being drawn.

The above was all the care bestowed. The plants flowered very beautifully in the early part of the summer. In autumn the old stems were cut away, and a slight top-dressing of the same mixture as was used for the original planting, was given. During the winter (the last three weeks of which have been severe frost, the thermometer frequently at 9° of Fahrenheit,) the frame has been covered with mats.

From the appearance of the buds now coming up, they offer to be much stronger this year than they were in the last; and I have no hesitation in stating, that all terrestrial Orchideous plants will do better under similar treatment than in pots or boxes.

I am, Sir,

Your most obedient servant,

Stewart Murray.

Glasgow Botanic Garden,
January 19, 1826.

P. S. I have annexed a list of the various Orchideous plants which have been hitherto cultivated in the manner now described, and have added the names of some other Herbaceous plants which have succeeded well in the same frame under similar treatment.

Orchideous Plants.

Aceras Anthropophora.
Arethusa bulbosa.
——— Ophioglossoides.
Calypso Borealis.
Corallorhiza multiflora.
Cymbidium pulchellum.
Cypripedium Calceolus.
——— parviflorum.
——— pubescens.
——— spectabile.
——— humile.
——— arietinum.
Epipactis palustris.
——— pallens.
——— ensifolia.
Herminium Monorchis.
Malaxis Liliifolia.
——— Correana.
——— Ophioglossoides.
Neottia cernua.
——— pubescens.
——— repens.
——— spiralis.
Ophrys Apifera.
——— Aranifera.
——— Muscifera.
Orchis ciliaris.
——— flava.
Orchis viridiflora.
——— tridentata.
——— bracteata.
——— spectabilis.
——— orbiculata.
——— dilatata.
——— macrophylla.
——— fimbriata.
——— hyperborea.
——— hircina.
——— ustulata.
——— militaris.
——— pyramidalis.
——— fusca.

Miscellaneous Plants.

Claytonia Virginica.
Dryas integrifolia.
Epigæa repens.
Mitchella repens.
Nuttallia digitata.
——— pedata.
Pinguicula grandiflora.
——— Lusitanica.
Primula pusilla.
——— minima.
Pyrola umbellata.
——— maculata.
Sarracennia purpurea.

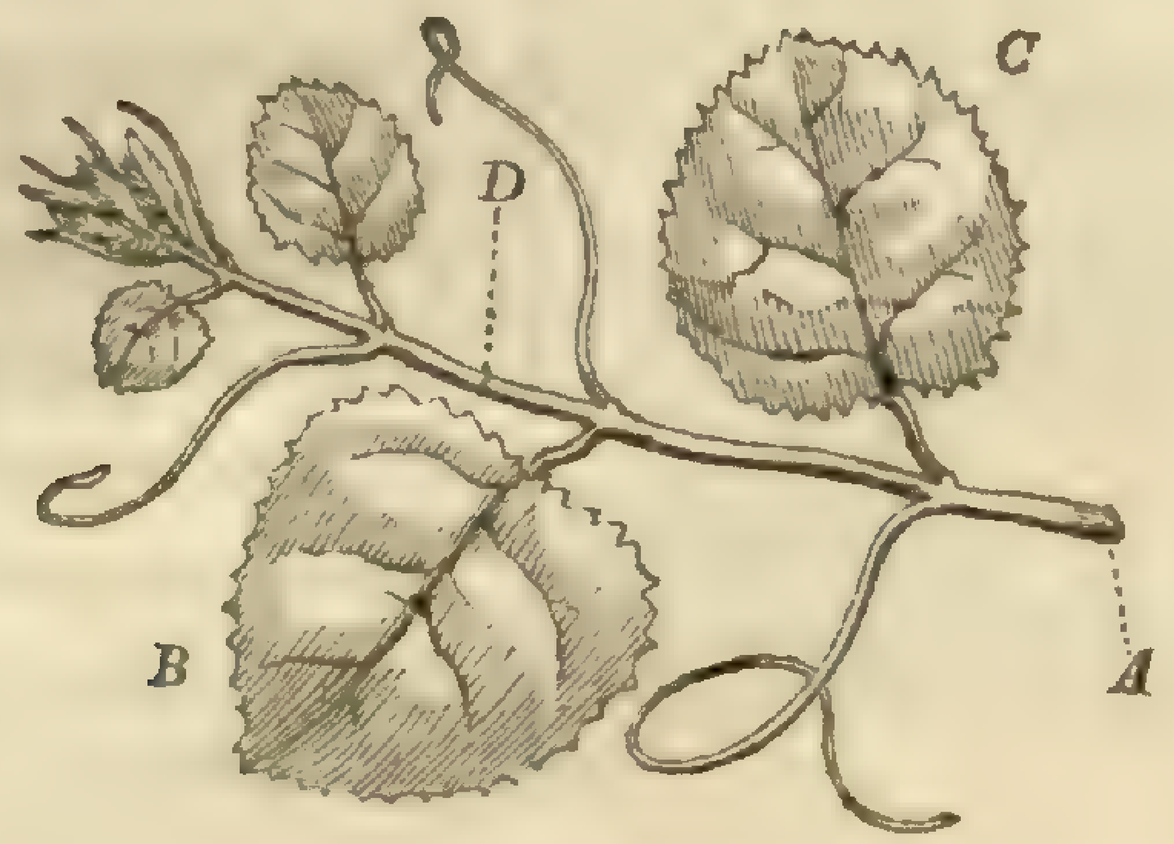
XLI. *Plan for obtaining a* Second Crop of Melons. *In a Letter to the Secretary. By Mr.* CHARLES HARRISON, *F. H. S. Gardener to* JAMES ARCHIBALD STUART WORTLEY, *Esq. F. H. S. at Wortley Hall, Yorkshire.*

Read October 18th, 1825.

SIR,

MY method of managing *Melon Plants,* in order to obtain a second crop of fruit, being very much approved of in this neighbourhood, and considered by most individuals who have seen it, very different from, and far more successful than any other, I am induced to send you the following description of it.

When the first crop of fruit is nearly gathered, I take off cuttings from the old plants. The cuttings which I select are those extremities of shoots which are shewing the most small fruit. They are cut off close under the second advanced joint from the top, as at A. The leaves B and C are taken off, and each cutting thus prepared is ready for insertion. I put two



cuttings into each pot, and insert them up to D, placing them close to the side of the pot, and filling the pots with light rich

soil, gently shaking it upon the cuttings. The pots used are twenty-fours. After being watered, I place the pots in a small one-light frame, a hot-bed having been previously prepared under it a sufficient time, to allow the burning heat to subside before the bed is thus used. I cover the bed to the depth of eight or ten inches with moderately dry soil; in this the pots with the cuttings are plunged up to the rim. The frame is then kept close for four or five days, in order to retain the steam, which is very essential in supporting the cuttings until they strike root. The frame is also shaded for some time during four or five hours in the middle of the day. Care is also taken that the heat is not so intense at the bottom of the pots as to burn the cuttings. In about a week the cuttings, if properly managed, will have struck root; this will be shown by their shoots pushing.

The first crop of Melons having been gathered from the old plants, I take out the soil in which they have grown, and replace it with some new, to the depth of twelve inches. The beds are also at the same time lined with fresh dung. In about ten days from the time of inserting the cuttings, they will be ready to plant out; and having prepared the original beds as here described, I turn out one pot of cuttings entire, under each small three-light frame, and to each large three-light frame I allot two pots, one to each end light. When the plants have pushed about fourteen inches, I pinch off the end of each shoot, to cause them to produce fresh runners. The fruit which had shewn previously to the cuttings being taken from the old plants will, after the cuttings are finally planted out, swell very rapidly, and in three weeks after the bed has been replanted, I have cut abundance of fine fruit,

some weighing seven or eight pounds each, varying in this according to the kind. The plants also yield abundantly, being much more productive and healthy than if they were old plants cut in, in the usual manner. I have uniformly gathered of the second crop from twelve to twenty fruit in each light.

A considerable advantage belonging to this plan is, that the plants never run to length, they need no more stopping than already described, nor do they require any thinning of the shoots. I have also to observe, that it often happens in Melon plants, not raised from cuttings, that the stems near the roots will crack, and when water is poured upon such places it causes the plants to perish; but this is never the case with those raised as above described.

At present, I have an abundance of fruit upon fine healthy plants, which since they were taken off as cuttings, have borne fruit upwards of two months.

I am, Sir,

Your most obliged and obedient Servant,

Charles Harrison.

Wortley Hall,
October 15*th*, 1825.

XLII. *Description of* American Fruits, *of which Trees have been transmitted to the Horticultural Society of London. In a Letter to the Secretary. By Mr.* MICHAEL FLOY, *Corresponding Member of the Horticultural Society.*

Read May 17th, 1825.

SIR,

I HAVE consigned to the care of Mr. DAVID DOUGLAS, a case, containing several trees and plants, which I beg to present to the Horticultural Society. As many of the Peach trees and Apple trees are of kinds which are either new or but little known; I have sent short descriptions of them for your information.

PEACHES.

1. *Washington Peach.* This is a most excellent and valuable fruit, very juicy, and delicious; ripe from the latter end of August to the first week in September; it is one of the finest kinds of Peaches, of the second class as to the time of ripening. Colour of the skin a darkish red on the exposed side, the lighter part inclining to pale yellow; the stone small and free.

2. *Kennedy's Lemon Clingstone.* This is a kind much in demand for preserves; the shape that of a large Lemon; a fine red colour towards the sun, the rest a beautiful orange yellow; the flesh yellow, juicy, of a sprightly flavour, and, when perfectly ripe, very fine. One fruit often weighs from nine to twelve ounces. It has been grown many years here, and is held in high estimation. Ripe from the latter end of September

to the middle of October, and may be kept till the beginning of November; but will require artificial heat to bring it to perfection in England.

3. *Morris's Red Freestone,* and

4. *Morris's White Freestone.* These are fine early Peaches, coming to perfection from the beginning to the middle of August, of the class denominated Rare Ripe Peaches.* Flavour very good. The two fruits come into season nearly at the same time, and are much alike in size and shape.

5. *Morrisania Pound Peach,* or *Hoffman's Peach.* The buds of this kind were procured from Gouverneur Morris, at Morrisania, a few miles from New York. It is an excellent Peach, with a free stone; fruit very large, weighing from twelve to fourteen ounces, very juicy and delicious. It comes in late, about the middle of October. Martin Hoffman, Esq. informed me that this Peach originated with him, that it came up from a stone, by accident, in his meadow on York Island, and that Mr. Morris took buds from the original plant. It is one of our finest Fall Peaches, and is in great repute. It will require artificial heat to bring it to perfection in England.

6. *New York White Clingstone.* This is a rich, juicy, soft, clingstone Peach, and by many preferred to every other kind. The juice is very rich and sweet; the flesh is white with a very slight tinge of red. Ripe about the end of August, or beginning of September.

7. *Mammoth Peach,* or *Saartye Mout Peach,* or *Aunt*

* The Rare Ripe Peaches are those with free stones, which ripen early in the season. Fall Peaches, afterwards mentioned, are generally (but not always), clingstones, and ripen in October.

Sarah's Peach. A very large fruit, and, when perfectly ripe, delicious; with a free stone; ripe the latter end of September or beginning of October. It has the fault of a large stone, but is worthy a place in a collection, on account of its great size and handsome appearance. It originated in New York, from a stone, many years ago. I have this fact from Mr. BREVOORT, now near eighty years of age, the descendant of a Dutch settler; he recollects the first tree, when he was quite a boy, and it was then called Saartye Mout, or Aunt Sarah's Peach; the stone is remarkable for always having two kernels, and he asserts that it always produces the same kind of fruit from the stone.

8. *Philadelphia Freestone,* called *Grosse Gallande* in Philadelphia, where it is probable it originated. I believe it to be different from the European Peach of the latter name; it is a good fruit, and worthy of cultivation.

9. *Blood Clingstone, or Claret Clingstone.* Is a large fruit, dark dingy red on the outside, and cutting like a blood beet in the inside; it has a brisk sharp flavour, too acid to be considered pleasant as a table fruit; it is, however, much sought after for preserving, on account of its singular colour. The stone is rather large. It is ripe and fit for preserving late in October.

10. *Orange Freestone Apricot Peach,* or *Early Yellow Mallacoton.** This is a very fine flavoured Peach, lively and

* On examining Mr. GEORGE LINDLEY'S List of Peaches, published in the fifth volume of the Horticultural Transactions, I think it different from his Abricotée or Orange, No. 73; but it is probable it originated here from a seed of that kind.

sweet tasted. The flesh is a fine golden yellow, the stone is free and rather small; ripe about the middle of August, and much esteemed by most people. It is worthy of cultivation in every good collection.

11. *Brevoort's Seedling Pound Peach*, was raised by Mr. Brevoort from a seed of the Morrisania Pound Peach, and is much like it, but ripens a fortnight or three weeks earlier; nearly the same shape and flavour as the Morrisania Pound Peach, before described.

12. *Early Sweetwater Peach.* This is the best early Peach we have; it is ripe here the latter end of July and beginning of August, about a week after the *White Nutmeg*, or, as it is here called, the *Anne Peach.* It was raised from a stone of the White Nutmeg; the flavour, however, is much finer; in size it is nearly twice as large, the flesh is very juicy and sweet.

13. *Dr. Graham's White Freestone Peach.* A fine Peach, perfectly white; it is of a very large size, and weighs usually about eight ounces; the stone small, the juice rich and sweet; it is ripe about the middle of September.

14. *Serrated Peach, Emperor of Russia Peach*, or *Unique Peach.* This is a very singular Peach: the leaves are very deeply and doubly serrated, the fruit ripens early, soon after the *Early Sweetwater Peach;* the fruit is deeply cleft, one half of it projecting considerably beyond the other; the stone is free and rather large; the flavour of the flesh is very good. The sort originated in the woods in New Jersey, not far from this place, near twenty years ago. It is singular that all the stones of this fruit produce plants with jagged leaves; but I have not seen one of its offspring so good as the original.

The branches are apt to have a mildewed appearance, and the tree seldom grows very large, but inclines to be low and bushy.

15. *George the Fourth Peach.* This is one of the finest Peaches I have seen, and the richest I have tasted; it originated in the garden of Mr. Gill, in Broad Street in this city. Captain Hamilton, who lives in the house adjoining, recommended it to my notice. I annex his letter* to me, giving an account of the Peach. This is the second year of its fruiting, and the first of my knowing it. I have given it the name as above; every one that has seen it has pronounced it the finest of Peaches; it is ripe the latter end of August. The original tree is remarkably thrifty, and bore a very full crop this season.

16. *New York Early Lemon Clingstone Peach.* This is a seedling, and no doubt raised from a stone of the *Old Lemon*

* Dear Sir,

In reply to your inquiries respecting the Peach Tree, from which, at my solicitation, you took cuttings last summer, for the purpose of budding in your Nursery, I answer;—The present is the first year of its producing. It is, I am well persuaded, a Seedling; the fruit it yields is, I think, of the Rare Ripe kind, of uncommonly large growth, with a stone remarkably small for the size of the fruit; the skin is uncommonly pellucid, with a beautiful blush on one side, and clear white on the other, with very little down upon it.

The flesh is very luscious, and of the most delicious flavour I have ever tasted. I weighed, on the 26th of August, the largest Peach that was produced, and it was full nine ounces and a quarter.

I remain,
Dear Sir,
Very truly yours,
James K. Hamilton.

New York,
November 5, 1823.

Clingstone, or *Kennedy's Carolina Peach.* I procured the buds from a tree in Forsyth Street at this place. The fruit is larger than the Old Lemon Clingstone, and ripens a fortnight earlier; it is an abundant bearer, and weighs from nine to twelve ounces. The flavour is the same as that of *Kennedy's Lemon Clingstone;* but its ripening earlier will make it more acceptable in England.

17. *Brevoort's Seedling Peach.* This was also raised by Mr. Brevoort, like No. 11, from the Morrisania Pound Peach, but is not at all like its original. The size of the fruit is middling, it is very juicy and rich; ripe the last week in August; the stone is small and free.

18. *Lady Anne Stewart's Peach.* This is a very juicy, rich, freestone Peach; when perfectly ripe it is very delicious, but it is not very large; it is white, with a small blush tinge; the stone is flat, and rather hollow at one end; it is ripe the second week in September.

19. *Hoyte's Lemon Clingstone,* originated in the garden of Mr. Hoyte, in Broadway, in this city, most probably from a stone of the *Pine Apple Clingstone,* which it much resembles. The fruit is very large, weighing usually twelve ounces, ripens late, and will require artificial heat in England.

20. *Pine Apple Clingstone,* or *Red Mallacoton,* is like the *Lemon Clingstone* in colour and flavour, but round, with a small tip at the end; ripens a week or a fortnight later, that is, from the middle to the end of October, and is more valued here consequently for preserving. When perfectly ripe, the juice is rich and lively; it has a little of the flavour of the Pine Apple; whence the name.

21. *Aster's Seedling Peach.* I had the buds from Mr.

ASTER's garden in the Bowery, (a street so called,) here. It is a very rich, juicy, sweet, fine-sized Peach, much like the Washington, and ripens about the same time; stone small. It is worthy of cultivation.

APPLES.

1. *Early Bough Apple.* This is the first large-sized Apple that appears in our markets; but it cannot be considered fine for cooking, being a sweet Apple. It is very pleasant for the table when ripe.

2. *Honey Greening.* I have not seen the fruit of this kind; the grafts were brought to me from Connecticut, by TIMOTHY GREEN, Esq. who recommended it very highly, as one of the finest kinds of Apples.

3. *Early July Pippin.* A very fine Apple, of handsome size, perfectly ripe in July, and excellent both for cooking and as a dessert fruit. It is the best early Apple I know.

4. *Ortley Apple.** The grafts of this Apple were brought to me by Mr. ORTLEY, of this place, from New Jersey. It is an excellent keeping Apple, and finer flavoured than the Newtown Pippin, according to his judgment; I have eaten of the fruit, and think it quite as good. It is certainly a dis-

* Several fine specimens of the Ortley Apple were received from Mr. FLOY in February, 1825, and exhibited at the Meeting of the Horticultural Society on the 1st and 15th of March subsequently. The Apple bears a close resemblance to the Yellow Newtown Pippin, but is a little more oval. The eye is large and well formed, not being deeply sunk, and is surrounded by many small folds or plaits. The stalk is slender, inserted in a deep even-formed basin. The skin is a bright clear yellow where shaded; and where exposed, is of a bright scarlet, sprinkled with a few spots of russet. The flesh is inclining to yellow, crisp and breaking, very juicy, with the same Pine Apple flavour which distinguishes the Newtown Pippin. *Sec.*

tinct variety from the Newtown Pippin; the tree grows more thrifty, and is a free bearer.

5. *Æsopus Spitzemberg.* The true Æsopus Spitzemberg is, I suppose, the finest eating Apple in the world when perfectly ripe; it is, however, not a keeping Apple; with care it will last till Christmas. It is most beautiful in appearance. Mr. Coxe, who describes this Apple at page 127 of his work on Fruit Trees, thinks the *Flushing Spitzemberg* nearly as good. The fact is, there are a number of kinds of Apples called Spitzemberg, and some of them even early summer Apples, that have the appearance, and probably originated from seeds, of this kind; but they are different, and inferior in flavour and quality. This variety no doubt originated at Æsopus, in Ulster County; it is plentifully cultivated at Livingstone's Manor, in Columbia County, in the State of New York, from whence the Apples are brought to this market, and always command a good price for table fruit. I have not seen any so fine from any other part of the country. I am informed, that it makes very rich Cider. The grafts of the trees I send you, I obtained from Edward Livingstone, Esq. of Clermont, the present proprietor of the manor; I can therefore warrant them to be the genuine sort.

6. *Large Fall Pippin.* A most noble Apple for cooking or the dessert: when ripe it is delicious, having somewhat the richness of a Pine Apple; when over ripe it becomes mealy and insipid, and it does not keep good longer than the end of October or middle of November: size very large, often weighing from fourteen to sixteen ounces.

7. *American Nonpareil.* The grafts of this kind I had from Staten Island, from the orchard of the late Vice Pre-

sident Tompkins: it is a fine Apple, well tasted, almost like the English Nonpareil, but rather larger. The tree bears abundantly. It is no doubt a very different Apple from the one described by Mr. Coxe under this name.* Origin uncertain. The shape is exactly like that of the English Nonpareil.

8. *Swaar Apple.* A large and fine flattish *heavy* Apple, as the Dutch name, *Swaar,* implies. It keeps well till spring; when perfectly ripe it is a very fine eating Apple, and it is also a good cooking Apple during the winter months. It was first raised in North Jersey by the Dutch. My grafts were obtained from Mr. Livingstone, who has them in great perfection. It is well described by Mr. Coxe.†

9. *Straat Apple.* This kind originated in a Street at Albany, whence the Dutch name, Straat or Street. It is a very fine Apple, and is not inferior in flavour to the Newtown Pippin; it is rather a larger fruit, but does not keep so long.

10. *Van Dyne Apple.* This is much like the Fall Pippin, though distinct. It is a very large Apple, often weighing from twenty to twenty-four ounces; in shape it is not so flat, and I do not think its flavour so fine, as that of the Fall Pippin; it is however a beautiful fruit, and sells well in the market, on account of its size. It was probably raised from seed of the Fall Pippin: it originated in New Jersey, opposite this city. It always goes by the name of Van Dyne Apple, after the name of the person who had it first in his orchard; it is never called the Fall Pippin.

In the case you will find some cuttings taken from a Pear

* See Coxe on Fruit Trees, p. 109. † Ibid. p. 161.

tree, which is one of the oldest inhabitants of this part of the world. It is known as Governor STUYVESANT's Pear, and is an excellent sort: the fruit and leaf resemble the Summer Bon Chrétien in appearance, but it is of higher flavour; it is ripe the third week in August. The tree looks healthy and vigorous enough to live another century. I am indebted to PETER STUYVESANT, Esq. the present proprietor of the estate where the tree grows, for the following account of it. It is supposed that it was imported from Holland, but of this Mr. STUYVESANT is not certain; but there is no doubt but that it was planted by old Governor STUYVESANT where it now stands. He assumed the government of the province, then called the New Netherlands, in 1647, which has always been considered to be the date of the introduction of the tree, it is consequently upwards of 170 years old. From its aromatic flavour, it is sometimes called the *Spice Pear*.

I am, with the highest respect,

Your most obedient,

and very humble servant,

MICHAEL FLOY.

New York,
December 6, 1824.

XLIII. *On the Cultivation of* Celeriac, *as practised in Denmark and Germany. In a Letter to* William Atkinson, *Esq. F. H. S. By Mr.* Jens Peter Petersen. *Communicated by* William Atkinson, *Esq.*

Read March 7, 1826.

Sir,

According to your request, I send you the following account of the method of cultivating *Celeriac*, or *Knoll-Sellerie*, in Denmark and Germany. It will be found to differ very much in the details from the directions given, on the authority of Lord Stanhope, in the Third Volume* of the Transactions of the Horticultural Society, for the cultivation of the same vegetable, as practised in the neighbourhood of Dresden.

Celeriac requires a light, moist, and well manured, or rich soil. The ground should be trenched in autumn two spades deep, and mixed with a good dressing of well reduced horse-dung; it must be dug again in spring, when the plants are ready to be put out. It is essential that the dung should be perfectly decomposed; if this has not been effected, it is requisite that the ground should first be cropped with other vegetables, such as Cabbages, Lettuces, &c., by which the manure will become well united with the soil.

For summer and autumn crops, sow the seed towards the end of February, very thin, in a moderate hot-bed, in good rich vegetable mould. When the plants appear, they must be inured as much as possible to the open air, to make them

* See Horticultural Transactions, Vol. iii. page 72.

grow strong, and not allowed to run into leaves; and they should be thinned so as to stand at least one inch apart from each other; the seed bed must always be kept very moist. The plants will be fit for transplanting about the middle of May, or when they are four inches high; and the roots, if well managed, will be fit for use in the end of July.

For a winter crop, the seeds must be sown in the latter end of March, or beginning of April, in a bed of good, light, and rich mould, or on a warm border. When the plants are about an inch high, they must be thinned to one or two inches apart; and, as before directed, the seed bed must be kept moist. In the beginning of June, or when the plants are about four or five inches high, they are fit for transplanting; this is to be done on a flat bed four feet wide, drawing on it with a hoe four lines twelve inches apart, and three or four inches deep; a small portion of the roots and some of the top of the plants are to be cut off, and they are then to be planted in the drilled lines, twelve inches distant from each other. They must be well watered, and the watering must be repeated every day if the weather continues dry; and the ground should be kept clear of weeds.

When the plants are grown to half their size, or a little larger, which, in the late crop, will be about the beginning of August, a small quantity of the mould round the root of each plant must be removed, taking care not to disturb or expose the main root; then cut off with a knife all the side roots, as well as the coarse large outside leaves, close to the plant, levelling the mould to each as this is performed, and when the whole is completed, the bed must be sufficiently watered.

In Denmark and the northern parts of Germany, the roots are generally taken out of the ground at the end of October, and preserved for winter use in sand in a dry house, or in a pit made in the open ground, secured from the frost, by which they are liable to be injured in severe winters, if not protected.

I have the honour to be,

Sir,

your most obedient humble Servant,

Jens Peter Petersen.

Mr. Lee's *Nursery, Hammersmith,*
February 23, 1826.

XLIV. *On the Cultivation of the* Nelumbium Speciosum. *In a Letter to the Secretary. By Mr.* Alexander Stewart, *F. H. S.*

Read March 7, 1826.

Sir,

Agreeably to your wish, I now send the particulars of what occurred here in the cultivation of the *Nelumbium Speciosum,* and which led me to adopt a plan of treating the plant different from that usually practised.

In the year 1824, the tub in which a plant of Nelumbium Speciosum was growing became leaky, so much so, that when filled up in the evening with the rest of the aquatics, it was nearly dry in the succeeding morning; this continued for some time, but the plant, notwithstanding, grew vigorously; I therefore determined to let it take its chance, and, about the middle of July, I had the pleasure to observe three flower stems rising amongst the leaves; they grew very strong to the height of four feet, or thereabouts, the flowers all expanded, and were from six to eight inches in diameter, the capsules also swelled to a considerable size, but none of the seeds came to perfection. Previous to this, I had not been able to flower this beautiful plant, I was therefore determined to follow the same process in the succeeding year, as nearly as possible, and I am happy to be able to state, that the experiment was attended with a favourable result, for a plant so managed in a tub about the same size produced five flowers. I was in hopes

also that I should have succeeded in procuring ripe seeds, and I have some reason to think this would have been the case, had the idea of assisting the fructification struck me sooner, for I endeavoured to do so with the last flower which opened, and the capsule of that swelled much larger than either of the others, and the seeds attained nearly their full size, though they were not perfect; I hope, however, to be more successful in the present year.

It is necessary, in addition, to observe, that the tub in which the plant grew was plunged in a corner of a pit in which pines are fruited, and which is kept during the greater part of the spring and summer at a temperature as high as from 65° to 90° and even to 100° of Fahrenheit; in winter the temperature is kept lower, being seldom above 60°. During that time the plant received but little water; and indeed the supply was diminished gradually from the time the plant flowered until it became almost dry, and it remained in that state during the winter. In the spring I gave rather more water, and as soon as the leaves began to grow a few inches above the surface I took out as carefully as possible all the old earth from about the roots and replaced it with strong rich loam; the tub was then kept nearly full of water, so as to allow the leaves to float, and was continued in this state until they were sufficiently strong to rise of themselves above the surface of the water, to the height of about eighteen or twenty inches; I then began to reduce the water by slacking the upper hoop of the tub so as to let the water escape gradually through the staves to about the level of the earth which the plant grew in; this it generally did in the course of the night. This process was pursued during the last summer, the tub being filled up with

fresh water every night until the flowers and leaves died away gradually, and the water, as before noticed, was reduced at the same time.

This is all I can say on the subject at present, which I hope will be sufficient to induce others to adopt the same mode of treatment, and prove the experiment fully. To those who are fond of the aquatic tribe, I know of none that is so splendid or more deserving of cultivation than the Nelumbium Speciosum.

I have the honour to remain,

Sir,

very respectfully

Your obedient humble Servant,

Alexander Stewart.

Valleyfield, Perthshire.
February 22, 1826.

XLV. *Description of a* Pit for Winter and early Spring Forcing. *In a Letter to the Secretary. By* Mr. Alexander Stewart, *F. H. S.*

Read March 7, 1826.

Sir,

It is with much pleasure that I now send you a description of the economical *Pit* used at this place *for preserving vegetables during the Winter*, and for raising early Salads, Potatoes, and other tender esculents, in the spring: indeed it would be tedious to mention the various articles that may be preserved and forwarded in this simple contrivance; the advantages I have derived from it for the last ten years enable me to speak with certainty of its utility. It may perhaps be more useful here than in the South, but to those who are desirous to have the table well supplied with vegetables during winter, its advantages will, I think, be obvious from the following details.

In the month of October, or sooner, according to the season, I begin to fill the pit by lifting all the Cape Brocolis, Cauliflowers, Lettuces, and Endives: of the two first, all such as are about to show their heads, some few a little forwarder, others somewhat later, so as to keep up a succession for use: in removing the plants from the different quarters of the garden care is taken to keep as much earth about the roots

as can be conveniently done, and at the same time a few of the outer leaves are trimmed off; they are then put into the pit, which must be prepared with a layer of earth at the bottom sufficiently deep for the roots of the plants. I generally proceed by planting in rows across the pit, placing the tallest plants at the back, and keeping the rows sufficiently distant to allow a free circulation of air; twelve or fifteen inches between the rows, and about five or six inches in the row, are sufficient distances for Brocolis and Cauliflowers; they must be kept as upright as possible and as high in the pit as the covers will allow; when planted, they receive a little water to settle the mould about their roots. The Lettuces, Endives, and other dwarf vegetables that are put in require the pit to be more filled; either rotten tan, or decayed leaves will do, with a little earth on the top, to raise the level of the surface within the pit sufficiently high that plants may receive the benefit of the sun and air. The whole of the plants in the pit are occasionally attended to; and all decayed yellow leaves removed. As much air is given every day as possible.

In the autumn, when the weather is mild and dry, the covers are frequently taken off altogether during the day. I endeavour at all times to prevent the pit being saturated with moisture. When the weather is rainy, the covers are lowered on the tilts, and they are shut down every night.

During winter, if the frost sets in severe, I frequently put on a covering of litter above the covers, to exclude the frost more effectually. I have known the pit covered up in this way night and day for a fortnight and three weeks together,

without the vegetables suffering in the least; and as a proof, this winter I had plenty of fine Cauliflowers for the table till the end of January, with a constant supply of Endive and other vegetables. I never hesitate to lift the covers during severe frost, to gather the vegetables as they are wanted, but of course the pit is covered up again immediately after.

When the winter crops are removed from the pit I prepare it for the spring vegetables, such as Radishes, Lettuces, Cauliflower plants, Celery, early Peas and Potatoes, all of which I can get at least three weeks earlier in the pit than on the open borders. I have also used it frequently to raise tender annuals, and to protect Dahlias which have been potted, previous to turning them out in the borders; and for any half hardy plants in summer. I likewise use it for Ridge Cucumbers, Vegetable Marrow, and New Zealand Spinach.

A further detail would, I presume, be quite useless; much less would have done for a practical Gardener; to those however who may think proper to make a trial of it, simple as it is, I have no doubt but they will find it answer for all the purposes to which I have applied it, and to many others, should circumstances require. In the garden here there are two of these pits, one an hundred, and the other about sixty feet long, by three and an half feet wide, and a general idea of their appearance may be formed from the perspective view of a part of one of them which I have added. The dimensions of the pits are given in the sections annexed to this communication. The cost of the whole was trifling. The wood of which the covers are made is common Scotch Fir rough from the saw, and though in use for ten years it is still quite

sound; the straw has been renewed twice during that period, and some repairs have been given for the third time this season.

I have thehonour to remain,

SIR,

very respectfully,

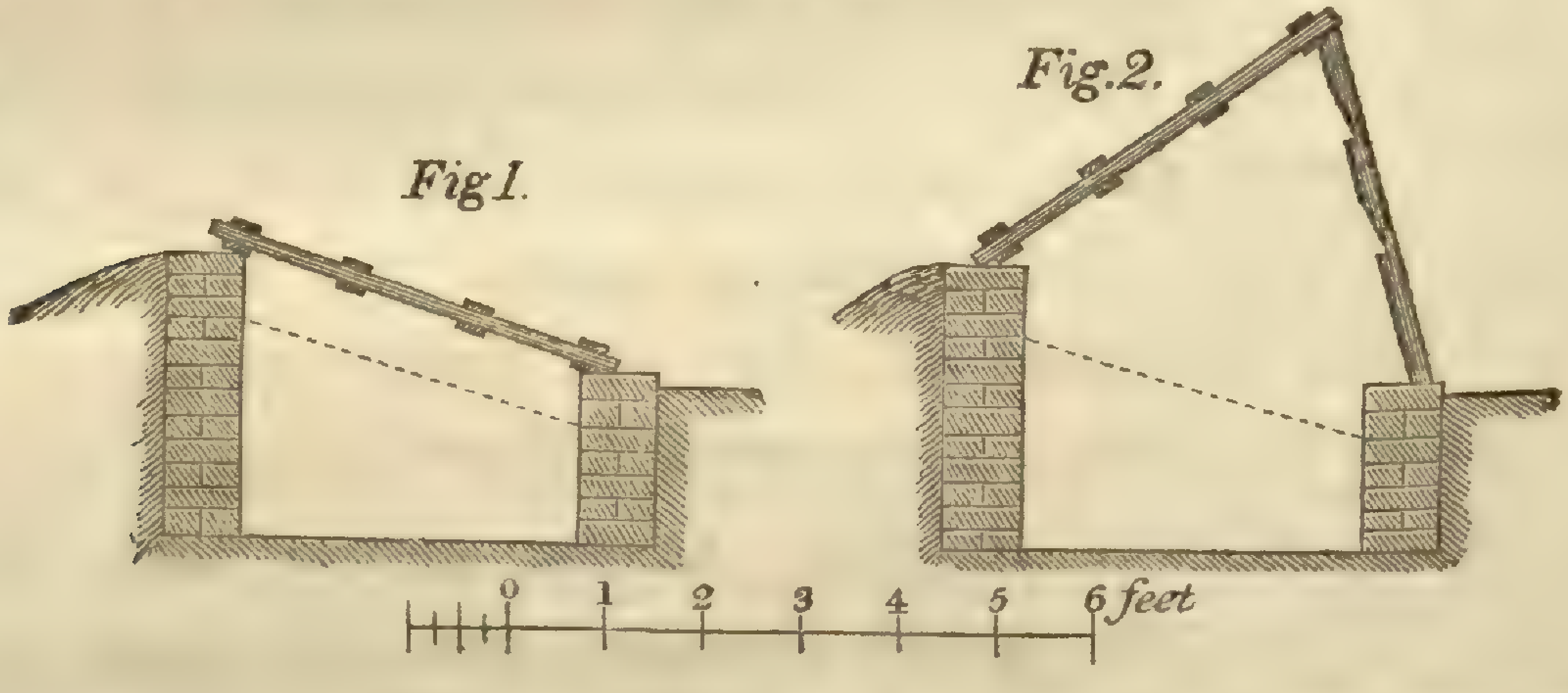
your obedient humble Servant,

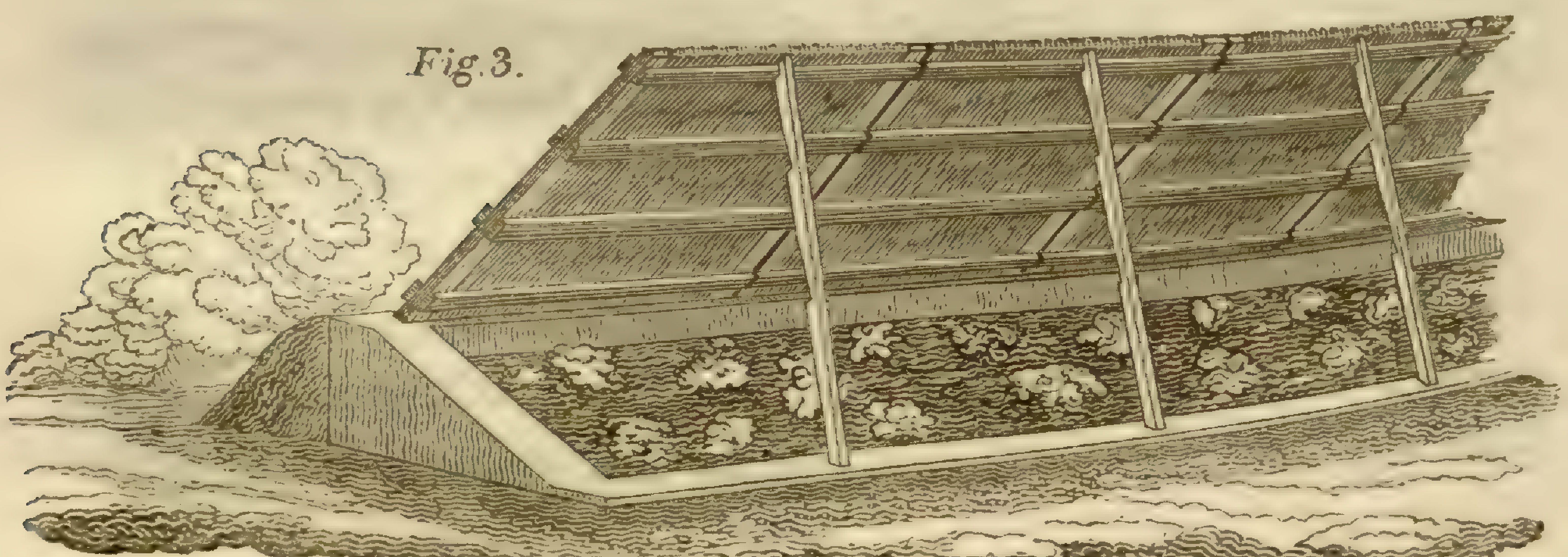
ALEXANDER STEWART.

Valleyfield, Perthshire,
February 23, 1826.

Explanation of the Figures.

Fig. 1. A section of the pit with the cover lowered.
Fig. 2. A section of the pit with the cover elevated by the tilt.
Fig. 3. A perspective view of a part of the pit.





XLVI. *Account of the Growth of some* Cedars of Lebanon, *in the Gardens at Hopetoun House, near Edinburgh. By Mr.* James Smith, *Corresponding Member of the Horticultural Society, Gardener to the Earl of* Hopetoun.

Read February 21, 1826.

Though the Pinus Cedrus, or Cedar of Lebanon, is found not only to stand the climate of Britain, but to attain also a large size, yet the fact of its being of very rapid growth is not generally known; of this, however, the following account of three Cedars in the Gardens at Hopetoun House will furnish very satisfactory evidence.

The extensive pleasure grounds at this place were laid out about the year 1740, and in that and the subsequent years, a great variety of curious ornamental trees was planted, which are now of considerable size, and in great beauty and perfection: among these are three Cedars, which were planted in the year 1748. The two largest are growing in a favourable deep soil, which although not wet inclines to be moist; the third is on a gravelly soil, beside a rill of water; their situation is well sheltered, and about one hundred feet above the level of the sea. In the year 1797 the third tree was the largest, and Dr. Walker,* who noted its size at that date, ascribes its superiority to the wetness of its situation. He has stated that it was five feet and one inch in circumference, but

* Essays on Natural History, 8vo. Edinburgh 1808, page 69.

omitted to mention at what height from the ground this measurement was taken.

In 1801 the dimensions of these trees as well as of other kinds planted at the same period, were taken; the observations were repeated in 1820, and I am now enabled to add the present size of those which had been before noticed, as well as of some others of different kinds, but of the same age, which were not before attended to.

The circumference of the trunks is taken in all the cases at three feet above the ground, and it will be seen by comparing the different measures, how much the Cedars have exceeded all the other trees.

	1801		1820		1825	
	ft.	in.	ft.	in.	ft.	in.
1st Cedar	10	0	13	$1\frac{1}{2}$	14	0
2nd Cedar	8	6	10	$9\frac{1}{2}$	11	4
3rd Cedar	7	10	9	$9\frac{1}{2}$	10	8
Sweet Chestnut	10	1	11	7	12	0
Beech	9	4	9	11	10	3
Sycamore	8	11	9	$7\frac{1}{2}$	9	11
Oak	—		—		8	6
Larch	—		—		8	4
Holly	—		—		5	8
Tulip-tree	—		—		5	8
Hemlock Spruce Fir			—		4	6

The two largest Cedars, standing at the distance of thirty feet from each other, and intermingling their branches, cover an elliptical area of nearly one hundred yards in circumference. They are about sixty feet high. The trunks, at no great distance from the ground, separate into a number of large limbs,

which, as in all our full-grown specimens of this species, ascend nearly to the summit of the tree without any strongly marked sub-division.* The secondary branches are disposed in that horizontal position which is so well known and so characteristic of the Cedar. In the present case this remarkable feature is almost lost to the view, as the trees do not occupy a very conspicuous point of the landscape. In the neighbourhood of Edinburgh there are no Cedars which possess lengthened trunks, except a few which are young, and which grow upon dry soils, where their progress is comparatively slow. From this it has been concluded that the Cedar would make but an indifferent timber tree. This is perhaps too hasty a conclusion, for this defect may arise from want of climate or mismanagement. The Weymouth Pine, which however is a less vigorous tree at Hopetoun House than the Cedar, has assumed an equally branched and still more bushy form, though it is known to be one of the tallest inhabitants of the North American forests.

* This appears to be the characteristic of the full-grown Cedar in its native soil; Burckhardt, describing the Cedars which he saw on Mount Lebanon, says "the oldest trees are distinguished by having the foliage and small branches at the top only, and by four, five, and even seven trunks springing from one base. The branches and foliage of the others [the younger trees] were lower, but I saw none whose leaves touched the ground like those in Kew Gardens." *Travels in Syria and the Holy Land*, page 21. *Sec.*

XLVII. *On the* Effects produced on Vegetation by the Combination of Heat and Moisture, *at different Periods of the Year. In a Letter to the Secretary. By* Mr. Archibald Gorrie, *Corresponding Member of the Horticultural Society.*

Read January 17, 1826.

Sir,

I may find it no easy task to clear myself of the charge of presumption, in attempting to write, as the title of this Communication would seem to imply, upon a subject similar to that which is treated of by Mr. Daniell, in the first Paper in this volume of the Transactions of the Horticultural Society. I shall only state, in extenuation, that if I had not read that very excellent Paper, and not calculated on the assistance of its distinguished Author, in promoting the investigation suggested in this essay, I would not have, at this time, incurred the risk of such an imputation.

The chief supports of vegetable life are well known to be heat, and moisture; it may also be added, that light is indispensible, but it is to the requisite proportional quantities of the two first that my present observations are intended to apply. To enable the practical Horticulturist to regulate and preserve a proper equilibrium of these elements suitable to the constitution of the plant under culture, he will find many useful and philosophical hints in the Paper above

alluded to. He will also find many of the successful modes of operation satisfactorily accounted for, which, I may observe, untutored sagacity had stumbled on, and which experience has sanctioned.

That heat is a prime agent in forwarding, and bringing to maturity the vegetable productions of the soil is well understood; but the degree of heat requisite to bring certain plants into flower, or to mature their fruits or seeds in the open air, and in a given time, or the effect which a greater or less supply of moisture at different periods has in accelerating or retarding the progress of vegetation, has not yet, so far as I know, been ascertained; nor am I aware that any observations have hitherto been made, at all calculated to elucidate an enquiry so generally interesting.

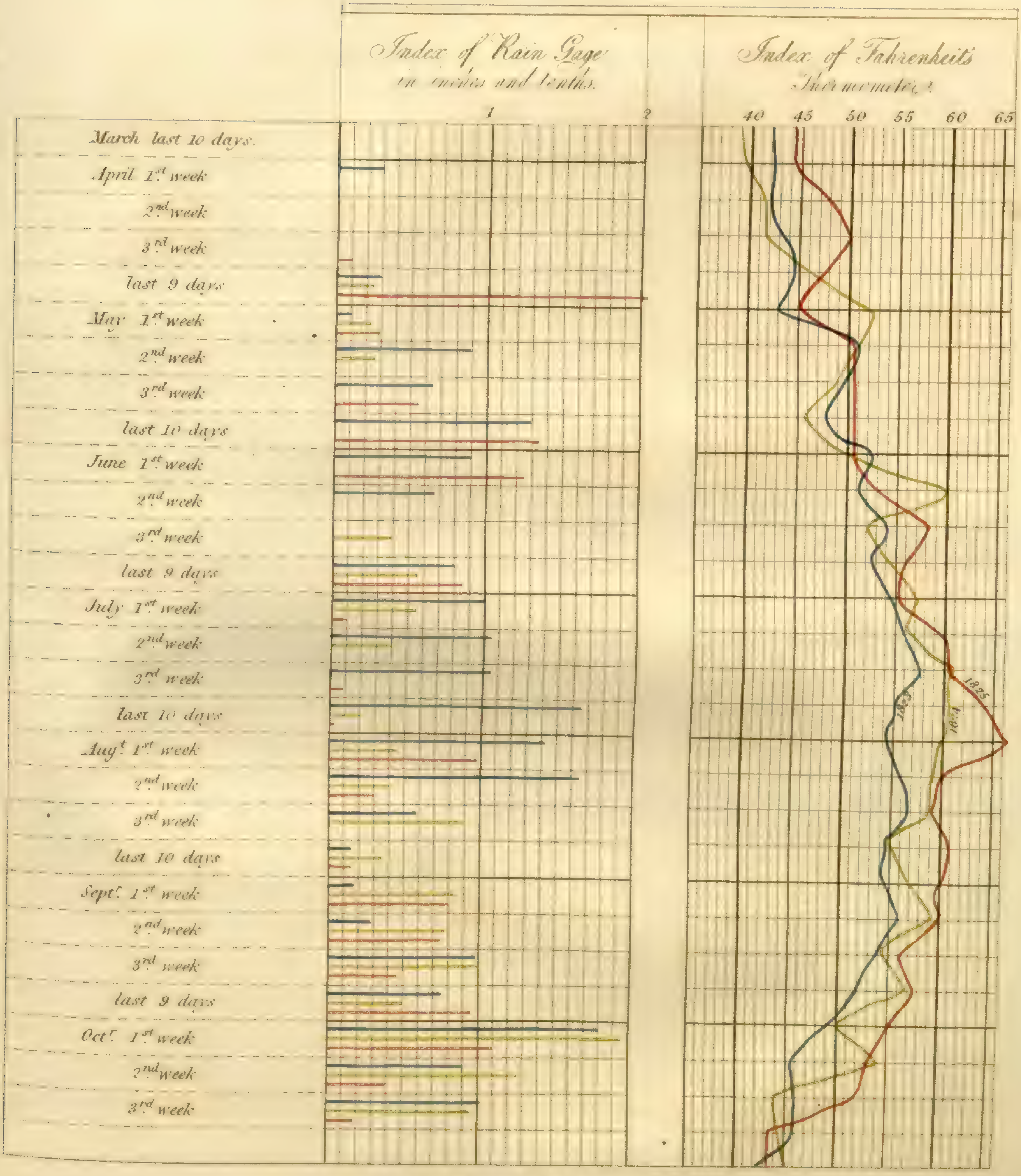
The observations which I have made and noted during the last three seasons at this place, which is situated in the Carse of Gowrie, enable me to point out some facts indicating the combined influence of heat and moisture, on the progress of vegetation, which may be deemed worthy of notice, and may induce the institution of similar observations in other parts of Great Britain.

The vegetating season, according to Professor Playfair, in his remarks on Temperature and Vegetation, inserted in the Transactions of the Royal Society of Edinburgh for 1800, commences about the 20th of March, and ends about the 20th of October: I suppose he means in the vicinity of Edinburgh. He divides that period into twenty-one decades, and gives the mean temperature of each. He assumes 40° as the lowest temperature, at which corn will vegetate, and 56° as the mean temperature of a good vegetating season.

We of the Carse of Gowrie, who live nearly half a degree north from Edinburgh, are seldom blest with what Mr. Playfair calls a good vegetating season, and yet vegetation here is as forward as in the vicinity of Edinburgh, a proof that its progress is not dependant solely on temperature.

Before I had seen Mr. Playfair's method of division in keeping a meteorological register, I divided each calendar month into four parts, of seven days in each of the three first, and nine or ten days in the last, according to the number of days in the month, recording the mean temperature and depth of rain in each division. The annexed diagram plate will at one view show these results for Mr. Playfair's vegetating season during the years 1823, 1824, and 1825. The blue coloured line in the thermometrical index, shows the temperature in 1823, the yellow in 1824, the red in 1825; similarly coloured lines on the index of the Rain-guage represent the depth of rain for the same periods.

The variation in the different lines on the diagram point out in a striking manner the variable nature of our northern climate. The mean temperature, for the vegetating season in 1823, was 50° 7′ (for the whole of that year 45° 6′). The rain that fell during the vegetating season amounted to $21\frac{1}{2}$ inches (during the whole of that year to 35.99 inches) the average annual fall at this place being 27 inches. The progress of vegetation was unusually slow; the low temperature, the excessive quantity of moisture, and the want of sunshine, retarded the ripening process of fruits, at least three weeks beyond the usual period, and tender fruits on walls did not ripen at all, nor was the wood ripened, as was shewn by the scanty appearance of blossom in the succeeding spring.



(Mr Gorrie's Register)
of the Rain Gage and Thermometer, in the Carse of Gowrie, during
the Vegetating Seasons of
1823, 1824 and 1825.

The mean temperature for the vegetating season in 1824, was 53° 1′ (for the whole of that year 47° 4′, which is nearly the average mean at this place); the supply of rain was limited, being only 13 $\frac{2}{10}$ inches for the vegetating season (and only 23$\frac{3}{10}$ inches for the whole year). The want of moisture at the root forced an early and, in some instances, a premature ripeness, the crops in general were short, and ready from three to four weeks earlier than in the preceding season. In England, rains were unusually heavy, which retarded the ripening of the crops in the south, and the harvest commenced simultaneously, that season, in the Carse of Gowrie, and in the southern counties of England, and under a difference of at least four degrees of mean temperature in favour of the southern counties, a proof of the influence of moisture in retarding vegetation.

The mean temperature for the vegetating season of the present year, was 54° 6′ (for the whole year to this date, December 22d, 48° 4′). The quantity of rain during the vegetating season only amounted to 10$\frac{1}{2}$ inches: by looking at the red lines in the index of the rain guage, it will appear that a considerable proportion of this rain fell before the end of June; it will also be seen that the temperature did not much exceed the ordinary average till towards the end of July; consequently, in the ripening of Strawberries, and other early fruits, this year, there was no particular indication of an early season. The elevated temperature and limited supply of moisture in July and August, brought on a simultaneous ripening of the crops in the fields, from two to three weeks earlier than the usual period. The ripening of wall fruit was in the same proportion accelerated.

These facts have been stated with a view to excite attention to the subject. The practical results likely to follow an accurate investigation appear to me to be interesting to the gardener and to the man of science. The Horticultural Society possesses sufficient influence and means to promote this enquiry on an extended scale, if so inclined; I shall feel happy in contributing my feeble assistance towards any investigation that may lead to the elucidation of the economy of vegetation.

To attain the object proposed, similar registers should be kept in different parts of the island, the observations to be taken exactly in the same manner, and with the same description of instruments; each observer noting carefully the progress of vegetation in certain plants, especially their times of flowering and ripening the seeds. The plants submitted to the experiments should also be cultivated in open situations, on soils and subsoils as nearly similar as possible, or if not, the difference should be noted.

I have the honour to be, most respectfully,

Sir,

your very humble Servant,

Archibald Gorrie.

Annat Garden, near Inchture, Perthshire,
December 22nd, 1825.

XLVIII. *On the Cultivation of Plants* in Moss. *In a Letter to the Secretary. By Mr.* John Street, *Gardener to the Hon. Mrs.* Hamilton Nesbitt, *at Beil in East Lothian.*

Read June 6th, 1826.

Sir,

With pleasure I communicate to you my method of cultivating plants *in Moss*. I am not aware that it has been practised by any person but myself, and therefore consider that I am the discoverer of the plan, which I now use extensively, and find it advantageous in many ways, and particularly beneficial to some plants.

The Mosses I use are the several species of Hypnum, such as H. Schreberi, squarrosum, purum, &c. these I collect in woods from under the bushes, taking up with them the decaying stalks and leaves which are found amongst them. Sometimes I add about an inch of the surface of the vegetable mould which is under the Mosses, to mix with them in the pots.

The Mosses so collected are pressed closely into the pots, and the plants are put into them as if into mould. For some plants I find it useful to add a little loam to the Mosses, in other cases sharp sand, which is sometimes preferable to the loam. If the plants require manure I give it in a liquid state. As the Mosses decay the mass gets closer together, and I then fill up the top of the pot with fresh material; but if the

roots are much at the lower part of the pot, I prefer making the addition at the bottom.

The plants which I have cultivated in Mosses are many; the following amongst others, Canna Indica and patens, Calla Ethiopica, Agapanthus umbellatus, Hydrangea hortensis, Disandra prostrata, Justicia nervosa, Gorteria rigens, Pelargoniums, Cinerarias, &c. Some plants do better, and flower earlier and more vigorously in Mosses than in mould, such as Eucomis striata, Eucomis punctata, &c.

The roots of whatever things are put into the Mosses spread and increase surprisingly, especially such as require to be kept wet, for the Mosses retain moisture longer and more uniformly than mould.

In my practice I find several particular benefits in using pots thus filled with Mosses, in preference to mould; they are so much lighter that they are moved with greater readiness, and in large sized pots the risk of breaking them from their weight when they are moved is avoided. Pots of ornamental plants which are to be placed in the apartments of a house, have great advantages when filled with Mosses, for independent of the facility with which they are moved, they make no dirt or litter on the floor, which often occurs when the pots are filled with mould. In sending plants to a distance those which are rooted in Mosses travel admirably, they turn well out of the pots, and the roots are so mixed with the Mosses that they do not separate from them as they would from mould; and besides this safety to the plants the Mosses are so light that the package is conveyed with great comparative ease.

I have succeeded in striking cuttings of many plants in

Mosses, such as Aucuba Japonica, Hibiscus Rosa Sinensis, Buddlea globosa, &c. and those make roots very freely and much faster than they do in mould. I believe the plan might be generally adopted in propagation by cuttings.

Some bulbs, I do not doubt, will do well in Mosses; I have tried the yellow Crocus, and found it to succeed perfectly, and to flower most freely when so treated. With Hyacinths I have not yet succeeded; the varieties of Polyanthus Narcissus, such as Grand Primo and Bazelman Major, blossom well when grown with a portion of Mosses in the pots. Some species of Cape Gladioli also succeed well.

Such are the results of my experience in this matter, and I shall be happy to hear that they are thought worthy of consideration by the Horticultural Society of London.

Moss answers exceedingly well to protect tender plants in open borders in winter, stones being laid on it to keep it in its place. Last year I planted out in the open borders some large plants of Agapanthus umbellatus; at the approach of winter I covered their roots with Moss, and then stuck some branches of evergreens round. All the plants survived, and all, I think, will blossom well, though the frost was very sharp. The branches and Moss were taken away when the keen weather ceased.

I am, Sir,

very respectfully,

your obedient humble Servant,

John Street.

Beil near Dunbar,
May 26, 1826.

XLIX. *Description of a* Pit and Stoves heated by Fire and Steam jointly. *In a Letter to the Secretary. By Mr.* William M'Murtrie, *Corresponding Member of the Horticultural Society, Gardener to The Viscount* Anson, *F. H. S. at Shugborough in Staffordshire.*

Read May 3d, 1825.

Sir,

I herewith transmit you a plan and section of a Pit, which is heated by a method rather unusual, but which has such merit, that it only requires to be more known to be generally adopted. The method is very simple, and so easy of execution that it may be carried into effect by any common bricklayer and plumber; the expense of the whole work is trifling, and when executed affords many of the advantages which arise from houses heated by steam, and without any consumption of coals beyond that which is required for warming the flue.

I have now had experience with houses of this description for nearly twelve years; during which time I have been entrusted with the care of Lord Anson's Gardens at this place; and my opportunities of observing their superior properties having been ample, I therefore have no hesitation in recommending them.

The outline of the construction of these houses is this; instead of a deep pit to be filled with tan, a shallow one is formed, by turning a flat brick arch over the space usually occupied by the tan-bed; into and through the hollow chamber thus formed, a flue constructed in the usual manner is carried. On the

top of the fire place which heats this flue, a boiler is fixed, which is supplied with water by a ball cock; the lid or cover to the boiler has a pipe from its top, which is carried into the chamber above the flue, and the steam which is produced by the water when boiling is thus conveyed into, and fills the entire chamber. From holes which are made in the sides of the pit, at about four feet, or the width of each light, apart from each other, both in the back and front of the chamber, the steam and heat from the chamber are admitted into the house at pleasure, and when this is not desired, the steam escapes by another opening out of the chamber into the external air. The holes for the admission of the steam and heat into the house are two inches and a half wide, and commence in the chambers as high as the arch will allow, as the steam and heat ascend thereby more easily; the openings are three inches below the top of the curb in the sides of the pit, and are stopped by wooden plugs when not in use. The escape-pipe or opening from the chamber is near four inches wide, and is stopped by a valve when the steam is in use. In the pit, which is thirty feet long, by thirteen feet wide, the flue after passing through the middle of the chamber is carried along the front, and then by one end to the chimney which is near the furnace.

It is obvious that the same fire which heats the flues causes the water to boil in the boiler over it. A pit of the above dimensions requires a boiler of about thirty eight gallons. The boiler should be made very strong at the bottom; and the lid or cover should be screwed on so close that no steam can escape, except through the pipe, which must be six inches in diameter. As the steam passes freely through

this pipe into the chamber, no safety valve is required. An arched passage, which is closed except when used, goes from the stoke-hole into the chamber to admit a man to clean the flues, or for other purposes.

I recommend a pit of this description for the growth of Pines, being of opinion that they succeed so much better in pits than in large houses, and I have no hesitation in saying that the frequent failures which occur in Pine growing are too often the consequence, solely, of the size of the house.

For Pines, the shallow space above the chamber is filled with tan about eighteen inches or two feet and a half thick, into which the pots are plunged, and the tan by the aid of the steam and flue in the chamber below is kept sufficiently warm.

There are two large stoves here, thirty feet long by sixteen feet wide, into which steam is also introduced in like manner. In these, the flue, after passing through the chamber as in the pit, is carried along the back wall of the house, and then goes into the chimney near the fire place; there is a front flue also constructed in the usual manner, which passes from a furnace at the other end of the house, and then goes out at a chimney near that belonging to the other flue. I have mentioned these stoves merely to show how very easy any hothouses of similar dimensions might be converted, to apply the same principle; the expense of a boiler, and the altering of the flue and pit would be trifling, in comparison with the benefits resulting from the change. Pine plants grown in these houses come to maturity much sooner than in any dry stove. Independent of the beneficial effects that the plants receive in these houses, there is a very great saving in tan,

as well as in the labour of turning the beds, which is no slight advantage. I have no doubt that stoves thus heated will answer remarkably well for early Vines, tender Exotics, and stove Aquatics.

In one of these stoves I grow Cucumbers only, and not only get them fine and abundant, but am enabled to cut them throughout the whole year; in the other stove I grow early Melons, which succeed as well as the Cucumbers, and when the Melons are done with in August, I clear away the soil and rotten dung, and lay about a foot thick of old tan upon the top of the arch, which forms a bed for my Pine suckers and crowns. I pot as many of my suckers and crowns as I have at that time, and likewise collect all the small weak plants from the Pine beds, and plunge them into the old tan, which has soon become sufficiently warm; there they remain until the end of February. Their growth is quite astonishing; from going into the steam house about the end of August little weak plants, they come out in February fine successions. As the pit in these stoves is wide, I generally fill the back part of it in October with about thirty or thirty-six of my late shown Pines, these do remarkably well through the winter, and produce very superior sized fruit to any that could be grown in a dry stove at that season of the year.

I communicated the plan of one of these stoves to a friend in Scotland in 1814, and I understand some houses have been constructed similar to it in that country; though not strictly corresponding to mine, and with less success, which I attribute to obvious causes:—firstly, the cavities of their chambers are too small, and without flues running

through them, and instead of allowing the steam to come into the houses from holes being made in the chambers, as above described, the chambers are made perfectly close, and when steam is required in the interior of the houses, they use extra pipes with a stop-cock, from the top of the boiler, to convey the steam into the houses :—secondly, instead of an arch, turned with single bricks, by which the chambers in my houses are covered, the tops of these chambers are supported by iron bars or rafters, and finished with slates or tiles laid in mortar; which I conceive not so good as a single brick arch.

I am, your most obedient,

and very humble Servant,

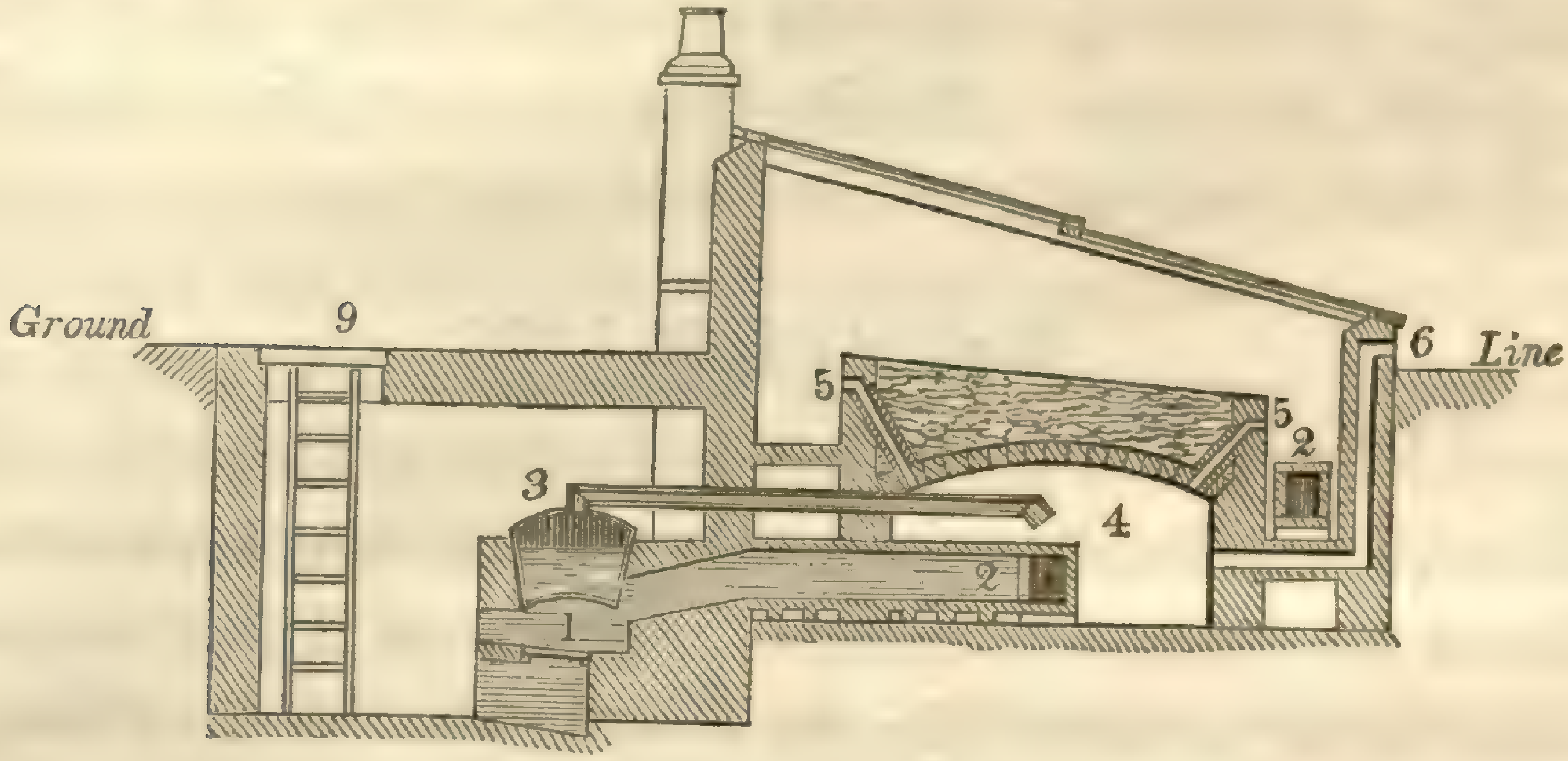
WILLIAM M'MURTRIE.

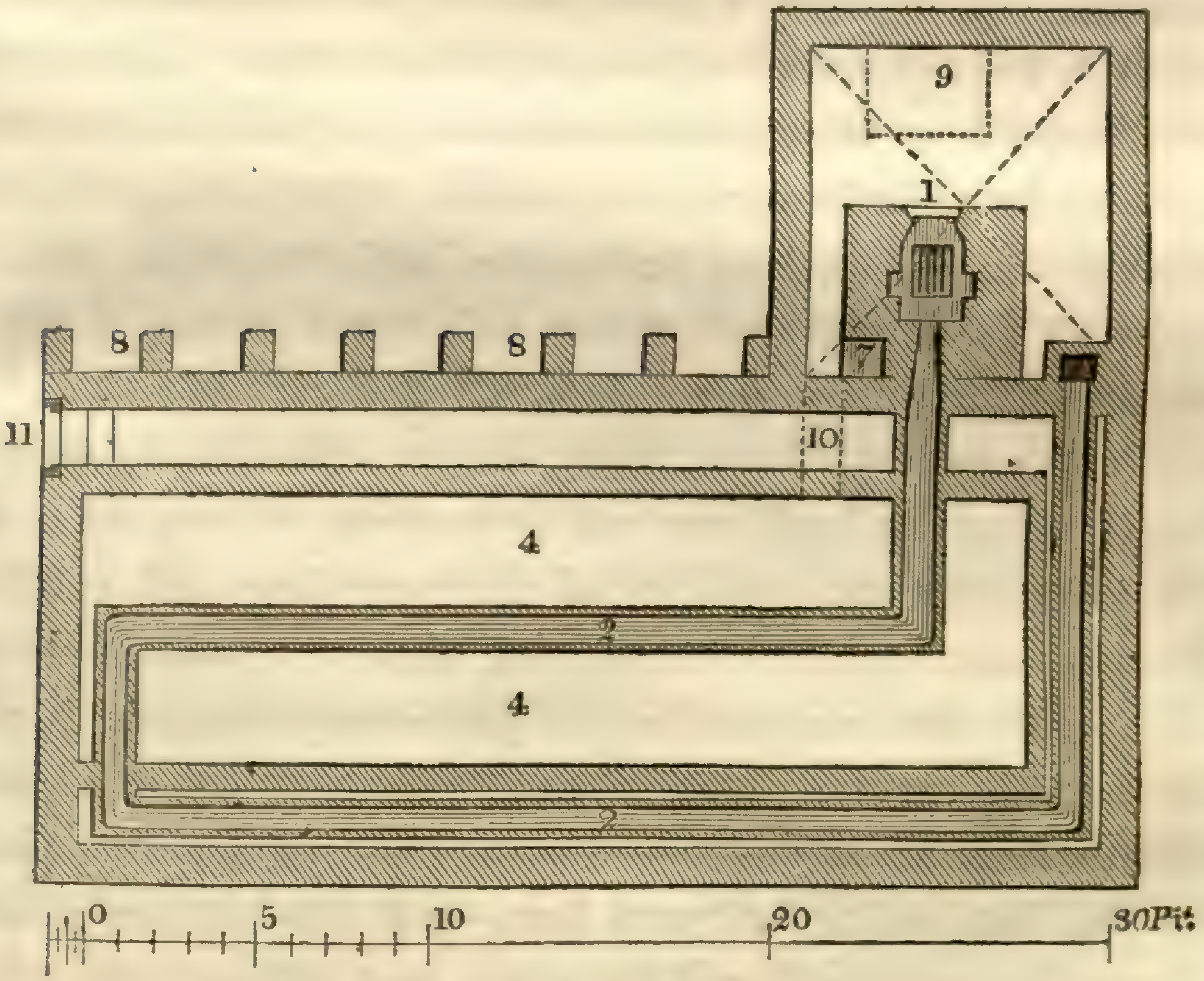
Shugborough Gardens,
March 2, 1826.

References to the Section and Ground Plan of the Pit.

1. Fire-place.
2. Flue.
3. Boiler and pipe.
4. Steam chamber.
5. Cavities to admit steam and heat, one under each light, back and front, to be stopped with plugs at pleasure.
6. Waste pipe, for allowing the steam to escape when the cavities are shut.
7. Cistern with a ball-cock for the supply of water to the boiler.
8. Piers to support stone slabs to stand upon while giving air to the pit.

9. Trap-door and ladder into the stoke-hole.
10. Place to enter to clean the flue.
11. Door of the pit.





Scale of feet.

XLIX. *Account of some new* Seedling Pears. *In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read April 18, 1826.

My dear Sir,

I have addressed to you a few grafts of six *new varieties of Pears,* for which, as a standard tree of each, I will request a place in our Garden. In the Transactions* of the Horticultural Society, in 1810, I stated that I had amused myself in attempts to create new varieties of dessert Pears, which would prove capable of being grown abundantly upon standard trees, in all moderately favourable situations, by fertilizing the blossoms of the Swan's Egg, and other hardy varieties, with the pollen of the late winter varieties of French Pears. I chiefly employed for this purpose the seeds of the Swan's Egg Pear, under the expectation of being able to combine, in some of the offspring, its hardiness and disposition to bear fruit, with the properties and qualities of the more late and excellent French varieties; and considering that the possession of a number of such varieties might prove very valuable acquisitions to almost every class of society, I made the experiment upon a large scale, and raised many hundred seedling plants. In the last spring between forty and fifty of these newly formed varieties produced blossoms; and although the season was so unfavourable that nearly all the blossoms of the coarse

* See Transactions of the Horticultural Society, Vol. i. page 180.

and hardy varieties of Pears, which had been planted for the press in contiguous orchards, fell abortively, nearly forty of the new varieties afforded fruits. Most of these were of little value; a part apparently not having acquired maturity, or perfection, owing to defect of climate; some were deficient in flavour, or had flesh which remained firm and breaking; and others had a disposition to decay internally, though in other respects not without merit.

The fruit of the six varieties of which I have sent grafts possessed more excellence than I ever expected to find in the first produce of any very young seedling plants; and it ripened at very different periods. Numbers 1 and 6 did not become soft and melting till the last week in March. Numbers 5 and 7 ripened in the end of February and the beginning of March. No. 2 in the end of December, and No. 13 in November. Numbers 1 and 2 are Pears of great weight. Each of the six varieties greatly exceeds the Swan's Egg in size, and No. 13 very closely resembles in form, size, and colour, the Crassane. The trees of all, except the last named, No. 13, are of the most luxuriant growth, and, with the exception of No. 7, which bore a large crop last year, all are very heavily loaded with blossom in the present spring.*

As the first blossoms of seedling trees, in all the cases which have come under my observation, have proved less capable of bearing unfavourable weather, than those which the same trees subsequently produced, I do not entertain any doubts of the hardy habits of those above described; and I am

* *July* 15, 1826. The blossoms have set perfectly well.

perfectly well satisfied that the fruit of Numbers 1 and 6 will be capable of being brought to market at as small an expense as ordinary Apples, in March, and possibly, in April.

The soil in which the seedling trees are growing is very strong, and favourable to the growth of the trees: but not to the quality of the fruit. The flesh of all the new varieties was more soft and melting than that of the Swan's Egg Pears which had grown in the same soil; and thence I think, that I have good reason to believe the new varieties will prove valuable to those who can command the produce of standard trees only. I, however, hesitate to recommend them to the public, till their qualities, when they have grown in other soils and situations, and particularly in the Garden of the Horticultural Society, shall have been ascertained.

I remain, my dear Sir,

sincerely yours,

T. A. Knight.

Downton,
April 2, 1826.

L. *On the Cultivation of the Species and Varieties of* Hedychium *in a Stove. In a Letter to the Secretary. By Mr.* Joseph Cooper, *Corresponding Member of the Horticultural Society, Botanic Gardener to the Viscount* Milton, *F. H. S. at Wentworth House in Yorkshire.*

Read March 21, 1826.

Sir,

The Scitamineæ are so beautiful, and so interesting, both on account of the splendid flowers which many of them produce, and their utility, that I do not wonder at the pleasure you enjoy in seeing them cultivated in English Hothouses. In the collection of Lord Milton at this place, a considerable number of this order of plants is cultivated. That the Hedychiums which form part of the collection should meet with your approbation in your late visit to Wentworth House, and that you should express yourself in terms of admiration at their appearance, and of the attention which had been paid to their cultivation, was highly gratifying to me; for cultivators of plants ought not, I conceive, to be insensible to the observations or remarks of those who are competent to judge of their labours; whatever is calculated to excite them to excel or to improve must be very beneficial to them, and perhaps, ultimately, to the public at large.

As you requested me to send you an account of my method of treating the Hedychiums, I will begin at the period when they have done flowering, which some had, when you were

here in October last: I then cease to give them water, till the present time (March), but keep them in the hot-house.

The first or second week of this month I consider the proper time to fresh pot them, in which operation, most of the kinds require parting: in doing this I select those roots which have the strongest buds, or which promise to make the stoutest shoots, taking care to cut off the old roots, which I consider useless, though they continue good, and will grow again, if it be desired, after being separated from the new ones. The soil I use for the Hedychiums is composed of three parts of very strong loam, in which the sward has rotted, the remaining fourth part consists of an equal quantity of peat, and very rotten dung well mixed together; after I have put the drainings into the bottom of the pots, I cover them over with about one inch thickness of good dung, previously to putting in any of the soil. The size of the pots I am careful about, planting the strong and tall growing species in very large pots, and the smaller growing sorts, in those of a proportionably smaller size. After potting, I place the plants again in the stove, giving them a little water; but the supply of water, for some time, until the shoots are of a considerable height, should be very moderate; when they have made some growth, and particularly in dry and hot weather, they can hardly have too much. The above method, which I have very briefly described, is that practised by me in growing these plants; of which the following species are cultivated here:

Hedychium angustifolium.
——— acuminatum.
——— aurantiacum.

Hedychium carneum.
——— coccineum.
——— coronarium.
——— elatum.
——— flavescens.
——— flavum.
——— gardnerianum.
——— glaucum.
——— longifolium.
——— maximum.
——— spicatum.
——— thyrsiflorum.
——— villosum.
——— ellipticum.

The pots are placed on the surface of the pit, in a division of a large stove, together with other Scitamineæ, but without any other admixture; they are not crowded together; the tallest occupy the back part of the stove, and some of them rise to the height of from nine to twelve feet; the shorter ones are, of course, placed in front. Their magnificent spikes of flowers, together with the fragrance of some of the kinds, produce a very grand effect.

I am, Sir,

Your very obedient humble Servant,

JOSEPH COOPER.

Gardens, Wentworth House,
March 9, 1826.

LI. *On* blacking Garden Walls. *In a Letter to the Secretary. By Mr.* Charles Harrison, *F. H. S. Gardener to* James Archibald Stuart Wortley, *Esq. F. H. S. at Wortley Hall, in Yorkshire.*

Read March 21, 1826.

Sir,

The *blacking of Garden Walls,* particularly when they are not flued, is so beneficial to the fruit trees trained on them in this cold part of the kingdom, that I most cheerfully comply with your request of sending to the Horticultural Society an account of the manner of putting on the colour as practised by me, as well as of stating the advantages which the plan affords.

When the leaves have fallen in the autumn, I take the earliest opportunity to loosen the trees from the wall and to prune them; the wall is then coloured with coal tar, mixing with every gallon of the tar one pint of linseed oil, in order to prevent it having a shining surface when dry. It is more necessary to make this addition in hotter parts of the kingdom than it is here, but even here it is essential in hot summers, for when the sun shines strongly on the wall with a shining black surface it has appeared to me to scorch those shoots which touch the wall; but this does not happen when the colour is rendered opaque by the mixture of the oil as recommended. If the wall had not been previously coloured I give it a second coat as soon as the first is dry. In laying on the colour care is taken that the liquid is not sprinkled upon

the trees, for it would close up the pores of the wood, and consequently do injury.

After the wall is coloured I allow the trees to remain loose from the wall until the coal tar has set (unless strong winds prevail, in which case I secure the main limbs and branches to the wall), in order that the shoots may not be damaged by coming in contact with it before it is dry. When the wall has become moderately dry, I nail the trees to it. A wall of sound bricks will not require recolouring more than once in ten years. Coal tar being very cheap a wall of considerable extent may be coloured for a trifling sum. Any dark coloured paint will answer the same purpose, but is far more expensive, and requires renewal more frequently.

The dark colour absorbing the rays of the sun, the wall acquires at least ten degrees of heat more than the walls not coloured as directed: thus affording great assistance in maturing the buds upon fruit-bearing shoots, so that the trees may be productive. In cold and wet seasons, without such aid, I should not have been able to obtain ripe buds upon fruit trees under my care. This I have had ample proof of by the unfruitfulness of those trees which are against walls not coloured, at the same time that trees against coloured walls were abundantly fruitful. The wall being coloured is also a preventive of insects harbouring in it and also tends to keep it dry.

The growth of young trees is much promoted by the colouring and they are sooner brought to a supply of fruitful buds.

I am, Sir,
Your very obedient Servant,
CHARLES HARRISON.

LII. *Account of a Plan for* Forcing Grapes in Borders under Glass. *In a Letter to Sir* George Thomas Staunton, *Bart. F. H. S. By the Rev.* Blakley Cooper, *A. M. Communicated by Sir* George Thomas Staunton.

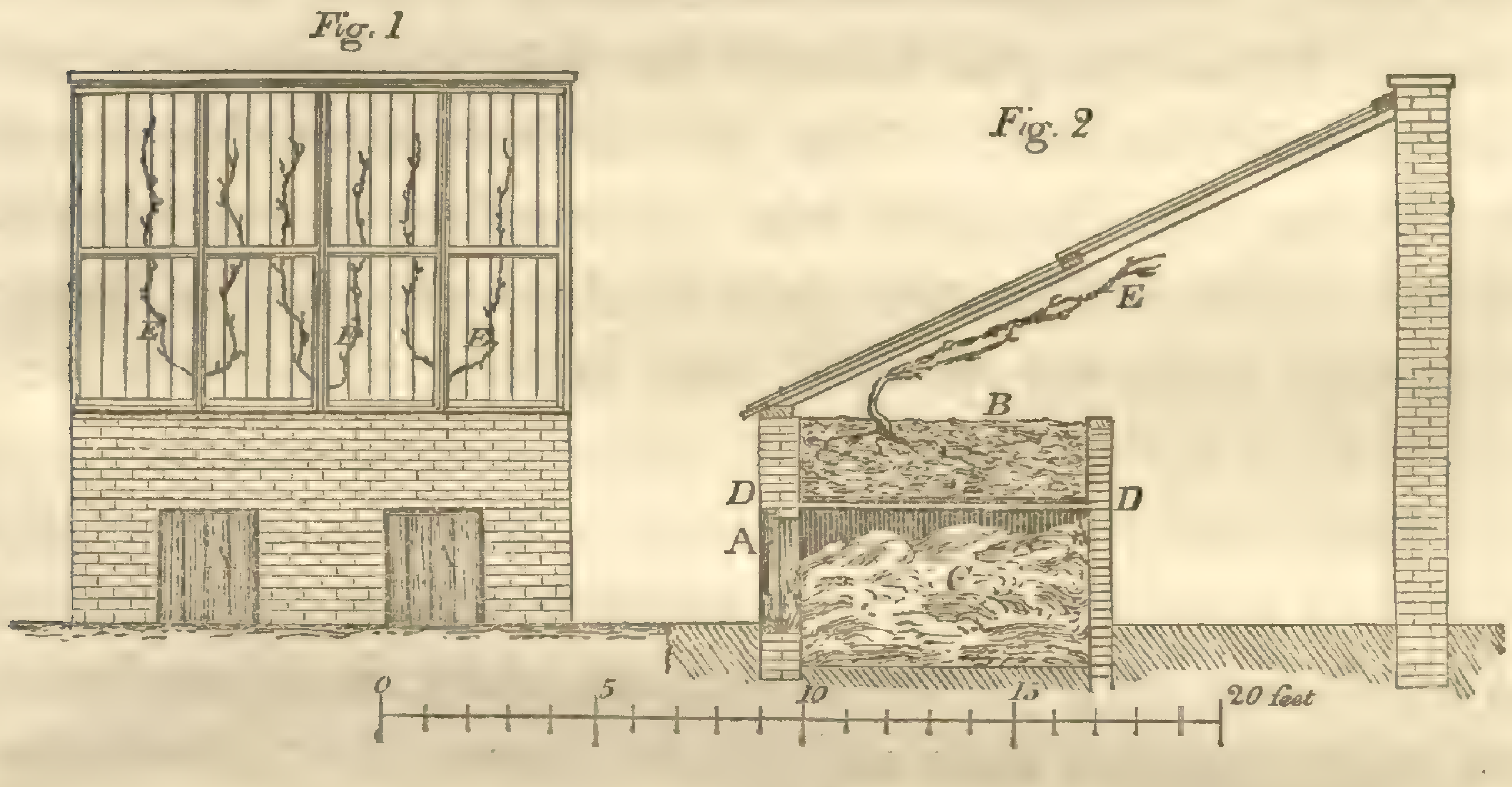
Read May 16, 1826.

My dear Sir George,

My reason for troubling you on the present occasion is in consequence of your intimation, that you propose communicating to the Horticultural Society the hints I gave you of the plan I have adopted in forcing Grapes. If you deem those hints of any value, I cannot for one moment object to your making use of them, in any way you please; but perhaps a more detailed account of the whole of my practice will be better calculated for the intended communication.

I have many years forced Grapes trained under glass, resembling Melon or Cucumber lights, with the aid of stable dung only: the dung having been deposited in pits, over which a layer of slate was supported by iron joists, and covered with coal ashes, three inches thick. In this way I have succeeded in raising abundant crops; but as it was impossible to walk under the vines to thin the bunches, and manage the luxuriant branches, I last year raised my glass several feet higher, to get head room; and in fact converted the pits into a common forcing house, with this difference,

however, that the parts appropriated to the dung and earth, were retained *within* the house; but calculating, that, in the extended space, the air would not be sufficiently heated by the dung only, I likewise introduced a flue to be worked when necessary, with fire. Annexed is a sketch of a front view of one of these pits, and a section of the same. Figure 1. is the front view, and Figure 2. the section.



References to the Figures.

AA. Doors for introducing dung into the Pit.
B. The border of earth in which the Vines are planted.
C. The dung in the Pit, under the earth.
DD. Iron joists, supporting a covering of stout slates.
EE. The Vines planted in the earth, and trained under the glass.

The dung is introduced through small doors, from the exterior. To each pit, there are two of these doors; through one of which half the pit is first nearly filled with dung; a week afterwards, the remaining half is also nearly filled through the other; in another week, fresh dung is added to the part first filled, and the same

operation is repeated alternately, every subsequent week; experience showing that the heat becomes languid in about a fortnight. By the weekly additions of dung, the fermentation is renewed, and a constant and equal supply of heat is maintained. The quantity of dung required to a single pit, ten feet long, by seven feet wide, and four and a half deep, is about ten wheel-barrows full, in each of the first two weeks; and three wheel-barrows full in every subsequent week. When the pits become too full, the exhausted useless dung is removed. These pits are covered with common Welsh, or Cornish slate, laid on cast-iron joists, without mortar. The soil on the slate is about two feet in depth; in it the Vines are planted, and trained under the glass above. *

I have long thought it unnatural to force the branches of a Vine in a heated atmosphere, whilst the roots are confined to a soil, that early in the season especially, is, if not frozen, the very reverse of hot: and I have presumed it to be impossible that the roots could keep pace, in their growth, with the branches, and consequently maintain that supply of sap required of them by the forced and accelerated advance of the shoots. It is well known to gardeners that a cautious and progressive temperature in the house can alone ensure success in bringing out all the eyes; that in most cases, when early forcing is resorted to, a few eyes only on each shoot can be made to break, and that all, except one or two of the

* I have for several years adopted, with success, the same plan of pits for raising Melons and Cucumbers; the peculiar advantage of these pits being a regular and constant supply of heat for any length of time, by the addition, at intervals, of fresh dung under the border in which the plants are grown.

leading shoots, will be weak and dwindling. Hence the system of cutting back (and thus sacrificing the best bearing wood) to short lengths, commonly called spurs. It is well known too, that, in the Pine stove, although Grapes grown there are brought to much earlier maturity, by the high temperature of the house, yet the crop is never in proportion to the quantity of bearing wood; and for the same reason, because the roots do not make equal progress with the branches, and the supply of sap, therefore, is not given up beyond the maintenance of a part, namely, of the leading shoots, the rest become weak and defective. The remedy for this is, I apprehend, so to accelerate the growth of the roots, as to enable them to keep pace with the branches, when the supply of sap will be adequate to all the demands of Nature. The bearing wood may also, by these means, be trained to any reasonable length, for every eye will receive a due supply of nutriment; each therefore will break regularly, and each make strong and vigorous shoots, and consequently be capable of bearing fruit. By this system too, Grapes may be brought to a ripe state in much less time; for, instead of the slow and cautious proceeding required for bringing out the eyes at the commencement, a high degree of temperature may be kept up in the house; for, as the roots are taking up, in consequence of their rapid growth, a larger quantity of nutriment, the supply of sap is more rapid; and therefore a more rapid growth of the branches may be promoted.

Acting on these principles, I commenced last year an experiment on a small scale, by planting in the border over one of

my pits three cuttings and one plant. The cuttings were the Chasselas and the Black Hamburgh; the plant, that sort generally cultivated in pots, and called by gardeners the Pot Grape. The whole were planted in the month of March, 1825. The cuttings were taken from the parent Vines the preceding January. The plant had not succeeded well in the pot, and had made previously but one little weakly shoot, not larger than a straw-mote; and this shoot had, during the winter, been cut back to about two inches in length. The cuttings immediately struck root, and in the course of the season, made the most vigorous shoots, of about eighteen feet in length. The plant made equally vigorous shoots, of almost double that length. All the shoots were headed back in the winter to about seven feet. This spring the eyes broke most regularly, and made, and are still making, the most vigorous shoots, many of them supporting three bunches. On the plant there are seventy-three bunches; on the three cuttings sixty-one bunches; many of a large size, and all of a most healthy appearance, and likely to ripen.

It was not in my power to attempt an accelerated growth of the shoots this season, having made the experiment in a part only of a large house, forty feet long, in which other Grapes are cultivated in the usual way. This experiment therefore goes only to establish the fact, that, by the plan, the vine may be brought into a more immediate bearing state, without waiting three or four years for filling a new house with wood, as is usually the case. It proves also that the supply of sap is greater, since all the eyes of branches seven feet long have broken with unusual luxuriance and vigour.

I presume that steam may be used with success for this purpose, but as the cost of a steaming apparatus is considerable, I prefer that which I have hitherto practised; besides, I am inclined to think that the vapour given out by the dung tends in some measure to nourish the vines, and to promote their vigorous growth.

I am, my dear Sir GEORGE,

your obliged and very faithful

BLAKLEY COOPER.

Yetminster, near Sherborne,
May 10, 1826.

LIII. *On* Glycine Sinensis. *By* Joseph Sabine, *Esq. F.R.S. Secretary.*

Read June 20, 1826.

Though the *Glycine Sinensis* is in the hands of most cultivators of rare and curious plants, I venture to bring it now to the notice of the Society, because I consider it one of the most beautiful that we possess, and as it is sufficiently hardy to stand the climate of this country, I am desirous it should become generally known. I hope to see it not only introduced into the ornamental parts of every Gentleman's garden, but also decorating the walls of our farm houses and cottages, to the covering of which, and especially of lodges at the entrances of parks, it is admirably adapted.

Though the plant is commonly called by the name affixed to the head of this communication, yet, amongst botanists, it has been recently attached to Wisteria, a genus founded by Mr. Nuttal, in his genera of North American plants,* which he applied to Glycine frutescens, separating it from its former station; and as the present plant has a near affinity to that, it has been described by M. De Candolle in his Prodromus,† as Wisteria Sinensis. These two are at present the only species known to belong to the genus.

The Glycine Sinensis was first introduced to this country from China in 1816. In May of that year Captain Robert Welbank, then commanding the Cuffnells East Indiaman,

* Volume ii. page 115.

† Part ii. page 390.

brought a plant of *it* with him from China, and gave it to Charles Hampden Turner, Esq. of Rooksnest, in Surrey, who kept it in the pot in which it arrived until 1819, when it first flowered. It was then turned out into the border of the Conservatory, where the original plant is now growing in a very flourishing state.* In the same month, but a few days later, in 1816, another plant was brought by Captain Richard Rawes, in the Warren Hastings East Indiaman, from China, and given by him to Thomas Carey Palmer, Esq. of Bromley, who planted it in the border of his Greenhouse, where it also first blossomed in 1819, and still continues to thrive.

From the former of these plants, the first that were propagated were given to the Garden of the Horticultural Society, and to Messrs. Loddiges, at Hackney; from the second, the earliest layers were presented to Lady Long, for her Garden at Bromley Hill, and to Mr. Lee of Hammersmith, and each of these, together with the original plants, have for the last three or four years been objects of admiration to all who have seen them.

The blossoms shew themselves before the leaves; their first appearance is that of thick short pale green tufts, in which the buds of the flowers are enveloped by long pale hairy bracts, which fall off as the racemes advance. These when full-grown, are from eight to fifteen inches long, each bearing from eighty to an hundred flowers on an average; they are pendent, and have much resemblance to those of a Laburnum, except that they are of a very delicate blush lilac colour, with

* In 1825 this plant, which had grown up a column of ten feet high, had spread its branches to nearly ten feet each way, and produced upwards of five hundred bunches of blossoms.

a very agreeable fragrance. In a conservatory, the blossoms expand in March, more or less early, according to the heat of the house. Against a south wall in the open air they first appear in the middle of April, and last nearly a month. Without the protection of a wall the opening of the flowers is in May, and their beauty continues till June. The plants frequently put out a small second crop of flowers on the young shoots of the year, immediately after the spring blossoming is past, but these are not so fine as the first crop of flowers, though they are darker in colour; they are subject to drop off prematurely. In the autumn, another crop of blossoms is produced; these come in August, and though not so abundant as the spring flowers, have an advantage in being mixed with the foliage. This autumnal flowering does not appear in perfection on the plants which are placed on walls, or under protection; in such situations the racemes are produced as early as July, but as they expand, the flower buds fall off; being apparently unequal to sustain the heat to which they are exposed. The leaves are as beautiful in their way as the flowers; they are nearly a foot in length, of a peculiarly delicate pale green, and elegantly pinnated.

The plant does not require any nicety of management; it is impatient of the knife, and succeeds best in good rich loam, though Mr. Palmer's is grown in a mixture of heath mould and light loam. It is at first slow in growth, but when it once begins to shoot, it extends itself rapidly. The branches are of considerable length, and in a conservatory should be placed near the glass. When trained against a wall, it has been found that the branches which are carried horizontally,

produce a greater abundance of flowers. When not placed on a wall, they require the support of a stake or trellis. The plant at Bromley Hill is beautifully trained on a frame of iron-work; the stem rises in the middle of an open shaft or column formed of four rods eight feet high, and from the top of this the branches are carried in all directions over the spreading parts of the frame, which in shape exactly resembles an open umbrella, with an expansion of about six feet. The appearance of the plant thus trained, when in flower, both in spring and autumn, justifies the placing of it amongst our best ornamental shrubs.

The Glycine Sinensis does not appear to have sustained any injury in the open air in gardens during the last severe winter; the plants which have fallen under my observation had the protection of mats, but I do not conceive that such covering was necessary; for one now growing in the late garden of my friend Alexander Mac Leay, Esq. at Tilbuster Lodge, in Surrey, that was not so protected, remained uninjured by the frost, and has since blossomed. It therefore may without doubt be considered as a hardy shrub in our climate.

The plant is readily propagated by laying the young green shoots in pots buried in the earth, and as these advance in growth, continuing to peg them down into fresh pots, leaving some eyes or buds above the ground; and thus many plants may be obtained from a single branch. Cuttings both of the wood and of the roots planted in loam, are said to succeed. I believe it has not yet borne ripe seed in this country, nor has any been brought from China.

It is probably a native of some parts of the Chinese empire distant from Canton, as it seems to be a novelty in the gardens

there; the two plants first introduced by Captains Welbank and Rawes were obtained from the garden of Consequa, a Chinese merchant; it had not before been noticed by any of the collectors who had visited Canton. Plants of it have since been brought home in different years for the Horticultural Society, and a drawing made in China in 1821, of a branch in flower, is in the collection of the Society.

It was to be expected that this handsome shrub would attract the attention of our different periodical publications. A figure of it first appeared in the Botanical Magazine, tab. 2083, from a specimen supplied by Mr. Turner, on its first blossoming in 1819. In 1822 it was figured in the Botanical Register, tab. 650, from the plant in Mr. Lee's Nursery. In the succeeding year, 1823, Messrs. Loddiges published it in the Botanical Cabinet, tab. 773, from their own plant. Another figure of it has lately appeared in the Flora Conspicua, tab. 46, the drawing for which was made from Mr. Palmer's Conservatory.

LIV. *On the* Pæonia Moutan, *or* Tree Pæony, *and its varieties. By* JOSEPH SABINE, *Esq. F. R. S. &c. &c. Secretary.*

Read June 6, 1826.

THE varieties of the *Pæonia Moutan* were long known from works on the plants of China and Japan, as well as from their representations on Chinese porcelain and paper hangings, before any plants of them were brought to Europe. The first that was introduced into England, was imported thirty-seven years since; and though attempts to bring home living plants of the species, have subsequently been made in almost all the succeeding years, especially during the last twenty, yet the number of varieties in our gardens were, until lately, only five, and of these, two have not been hitherto sufficiently distinguished from the others. That several more exist in China, is well known, not only from descriptions, but from authenticated representations which have been transmitted from that country.

My object in this Paper, is to communicate some details respecting those kinds which have been hitherto cultivated here, as well as to describe and give accounts of four new varieties which I have seen for the first time in the present season. The first of these is an imported plant; the three others have been raised from seed produced in this country.

The introduction from China, of Moutans of any description, is attended with difficulty, for of the plants which are

put on shipboard in China, to be brought to England, very few live to reach their destination. With the exception of the Azaleas, they seem to bear a long voyage worse than any other of the productions of the Chinese gardens, which we have hitherto obtained.

Large quantities of flowering plants closely laid together in open packages, without mould to their roots, are annually brought in the course of the winter, from distant parts of the Chinese Empire, to Canton. These, notwithstanding this exposure, blossom in the ensuing spring; but either from the climate not agreeing with them, or the treatment they receive being unsuitable, the state of those which survive to the autumn, is such that they are not fit for removal with any chance of success. After their first blossoming at Canton, these plants never flower again, but dwindle and decay, and from this cause, the Captains of the British Indiamen, which leave Canton in the winter season, are unable to obtain any which have been proved to be of the more desirable kinds. Their purchases are necessarily made from the stock brought into the market in the manner above mentioned, in which the varieties most wanted are either very rare, or only sold to the Chinese; and are, besides, not very easily distinguishable whilst divested of their foliage; so that the living plants which do arrive in England, usually turn out to be the sort which we have had here longest as well as in most abundance, and which it may be presumed is the most common in China, or at least at Canton.

At the time when the Moutans blossom in the Chinese gardens, the officers of the East India Company are absent at Macao, to which place they remove after the departure of

the ships, the latest of which usually sails in February, or early in March, so that those English gentlemen who attend to plants there, have not the opportunity of seeing the different varieties in flower; and the knowledge of them is consequently confined to the native residents of Canton. This circumstance will account for the uncertainty which still exists respecting their number and differences.

The best account of Pæonia Moutan hitherto published, is by the late Mr. GEORGE ANDERSON, in the Transactions of the Linnean Society;* it forms part of a monograph of the genus Pæonia, which was written in the year 1817. He, with great propriety, brought together the different Tree Pæonies, which had been before considered as distinct species; and also with equally good judgment adopted the only single flowering plant then ascertained, as the type of his species. M. DECANDOLLE published† the genus in the first volume of his Systema in 1818, subsequent to the production of Mr. ANDERSON'S Paper; but without however having had an opportunity of examining it. Though three kinds had been described by Mr. ANDERSON, M. DECANDOLLE only gave accounts of two; and he also varied from the order adopted by the former gentleman, by placing the single flowering plant, the second in his arrangement In his Prodromus,‡ however, published in 1824, he adopted the order and the three plants of Mr. ANDERSON.

Both these writers agreed in the adoption of the Chinese

* Transactions of the Linnean Society, Vol. xii. page 248.

† DECANDOLLE, Regni Vegetabilis Systema Naturale, Vol. i. page 386.

‡ DECANDOLLE, Prodromus Systematis Naturalis Regni Vegetabilis, Pars I. page 65.

word Moutan, as the specific name; that was first applied to it by Dr. Sims,* in 1808; and he was followed in the use of it in the second edition of the Hortus Kewensis;† and though some writers‡ have given other specific names to it, yet that of Moutan seems now established; Kæmpfer's§ account of it is under the name of Botan; and in the Mémoires sur les Chinois,|| compiled by the Jesuit Missionaries, and published in France in 1778, it is called the Moutan.

Pæonia Moutan is readily distinguished from all the other species of the genus by its suffrutescent stem. The majority of the plants at present in our gardens are small bushes, not exceeding four feet in diameter; some few old ones are larger, and they will grow to be eight or ten feet high, and will extend equally in breadth. The branches if sufficiently vigorous, produce each a single flower at their extremities. The leaves are very distinctly biternate; they are shining green, more or less dark above, glaucous underneath, and may be described as smooth, though a very few hairs occasionally exist on their petioles and the under parts of the folioles. Differences in the leaves of the varieties are observable; the flowers, however, afford the chief distinctions, in the number, colours, and markings of the petals. The flower buds differ from those of other species of the genus,

* See Botanical Magazine, folio 1154.

† Hortus Kewensis, Edit. 2, Vol. iii. page 315.

‡ It is called P. suffruticosa in the Botanist's Repository, folio 373, &c.; P. fruticosa in Dumont de Courset's Botaniste Cultivateur, Edit. 2, Tome iv. page 461, and P. arborea, in the 5th edition, page 134 of Donn's Hortus Cantabrigiensis, as well as in some of the preceding editions of the same work.

§ See Kæmpfer Amænitates Exoticæ, page 862.

|| Vol. iii. page 461.

in having almost uniformly five spatulate bractes arranged circularly close below the calyx. The calyx leaves are five in number, of different sizes, as in the species of Herbaceous Pæonies. The flowers in a conservatory first appear in April, and are produced and remain in beauty till the middle of May. In the open border they open in May, and continue to expand until June. The membrane which so conspicuously envelopes the germens in the variety called Papaveracea, may be observed nearly as perfect in some of the other varieties. The natural number of germens (called Carpella by M. DECANDOLLE in his Prodromus) is five; these are occasionally multiplied to six, which was erroneously supposed* to be the regular quantity in the Papaveracea. When a greater increase takes place in the numbers of the germens, the multiplication of them is within the centre of the proper ones, and they are then often very numerous. The seeds, as far as my observations have extended, are dark brown when ripe.

1. *Pæonia Moutan Papaveracea.* The plant which has been adopted as the type of the species, in consequence of its having single, or rather nearly single flowers, has been always called Papaveracea, not because its petals are like those of the Poppy, but because its germens, when enveloped by their membranous covering, resemble a capsule of the large Papaver Somniferum. It was when first described in 1807, in ANDREWS's Repository, folio 463, considered as a separate species; and adopted as distinct from the other two plants then known, by Sir JAMES EDWARD SMITH, in REES's Cyclopædia, on the ground of a supposed specific dissimilarity, founded on its germens being always

* ANDREWS's Repository, folio 463. SMITH in REES's Cyclopædia, art. Pæonia.

enclosed by a membrane; but it is now considered that this circumstance would appear in the other varieties, if their seed vessels were not multiplied by luxuriance beyond their natural number, and it exists in all, when the difficulty alluded to, does not prevent it.* The P. Moutan Papaveracea was imported by Captain James Pendergras, in the Hope East Indiaman, for Sir Abraham Hume, in 1802, and the plant first blossomed in 1806.† I do not believe that any other plant of the variety has been brought from China, and if the fact be so, Sir Abraham Hume's is the parent of the whole stock now in Europe. Doubts were long entertained whether it was not an accidental production, and consequently a stranger in the Chinese gardens; but the Horticultural Society has lately received a drawing of it, made for them at Canton from a living specimen, which proves its distinct present existence in China. Sir Abraham Hume's plant at Wormleybury has attained a considerable size, forming a bush of near forty feet in circumference, and seven feet in height, which in the month of April is covered with its splendid flowers in almost unrivalled magnificence. In the past spring of this year it produced 660 flower-buds,

* The error of considering this as a distinct species, originated with the Editor of Andrews's Repository, in the folio above quoted. Dr. Sims, in the Botanical Magazine, folio 1154, expressed his doubt of the propriety of this separation; it was however adhered to by Sir James Edward Smith, in his account of the genus in Rees's Cyclopædia; but the matter was entirely put right, and the question finally settled by Dr. Sims, subsequently, in the Botanical Magazine, folio 2175. He had very justly observed that if the distinction was natural, it would constitute a generic, not a specific difference.

† Not 1800, as noted in Rees's Cyclopædia. It is erroneously stated in Mr. Anderson's account of the plant in the Linnean Transactions, as having been introduced about 1806. The date of 1805 in the Botanical Cabinet is also wrong.

of which 130 were taken off with a view of increasing the size of the flowers. In some seasons, and especially of late years, the flowers have been semi-double; when the plant was younger, they were more single, but seldom had so few as five petals; their expansion is about ten inches, sometimes more; the petals are very large and broad; they spread widely out, but are not reflexed; they are white, with a deep purple spot on the lower part of each petal; the spots are rayed, in lines about an inch and a half long, from the centre, forming a brilliant and rich star in the middle of the flower; the edges of the petals are a little jagged. The anthers are yellow, and are very conspicuously interposed between the dark spots on the petals, and the deep purple case of the germens, the stigmas appearing united at the top of it. After a time the germens break their covering, and then the envelope disappears; but it remains perfect unless the capsules swell. The germens, as have been before observed, are stated by some of the writers who have described them as being six; but five is the usual, as well as the most correct number, and these as they advance, spread out in a starlike fashion. The scent of the blossom is not pleasant, but it cannot be said to resemble that of Elder, which I have heard observed; it is more like that of a Poppy. Andrews's figure, above referred to, is tolerably good. That in the Botanical Magazine, tab. 2175, represents the flower smaller than it usually is produced in our gardens. A neat figure of it has also been given in Messrs. Loddiges' Botanical Cabinet, tab. 547. The Chinese drawing which I have mentioned, represents the flower as considerably smaller than it is produced with us, but it certainly is

intended for the same plant. Though rare, the P. Moutan Papaveracea is in the gardens of all curious collectors, but no plants have yet got to a size which can compete with the parent. The foliage of this variety is readily distinguished from that of the Rosea, by its petioles being tinged with red, and the folioles being a darker green; the leaves of the Banksii are similar, in having a tinge of red on the petioles, and in the darker hue of the folioles, but under similar circumstances, those of the Papaveracea are larger and broader. Sir Abraham Hume's plant has produced seeds, one of which vegetated some years since, but the plant subsequently perished. Mr. Lee, of Hammersmith, has also raised from its seed, plants which blossomed this year for the first time; the flowers however did not differ from those of the parent. M. Decandolle* has certainly erred in referring the P. officinalis, var. alba, of Loureiro to this plant.

2. *Pæonia Moutan Banksii.* This was introduced to the Royal Gardens at Kew, in 1789,† and was the first of the species that was brought to Europe; it blossomed at Kew for the first time, a few years after, I believe in the year 1793. Mr. Anderson has annexed to the variety the name of Sir Joseph Banks, to whose instructions it is understood that our Gardens are indebted for its original importation. Many plants of the same have subsequently been brought from China, and from these, as well as from the original plant, a very general stock of it now exists. It is probably the most abundant kind in China also. The flowers are usually quite double, and spreading, with an expansion of

* Decandolle, Systema, &c. volume i, page 387.

† Erroneously stated to be 1794, in the Botanical Register, folio 379.

eight or nine inches; sometimes they are so full as to force the calyx to turn back on the peduncle, and then the outer parts of the flower also turn downwards; but both this, and probably all the Moutans, vary as to the number of petals they produce, according to the soil they are placed in, and the degree of establishment in that soil. Sometimes the Banksii produces flowers totally destitute of petals at all, and many are intermediate between that state and the fullest flower. The petals are slightly tinged with blush, becoming nearly white at the edges, and are marked at the base with purplish red; this darker colour sometimes regularly mixes with the paler parts of the petals, and sometimes has a slight appearance of running into it in rays, or featherings. The petals gradually diminish in size as they approach the centre of the flower, and have there more of the purple colour diffused over them; the edges of the internal petals are also more jagged or broken. The germens are numerous, growing in a thickened mass, surrounded by the yellow anthers, and are conspicuous when the blossom is semi-double, which is occasionally, as above observed, the case. When the flower is very full, the petals are mixed with the stamens, and a considerable number of petals, much longer and larger than those which are ranged outside and amongst the stamens, rise from amidst the germens. Variations in the characters of the flowers, from semi-double to full double, take place on the same plant, and in the same season; but in general, the older plants produce fuller flowers. This kind also, under different circumstances of exposure to weather and warmth, varies in the intensity of its general colour; the blossom having sometimes more of the purple

hue than at other times. The scent of the flower is very different, at different periods, and perhaps also on different plants; in some it is far from disagreeable, in others strong and heavy. The distinction between the foliage of this variety and the Rosea, is in the red colour of the petioles, and the darker green of the folioles; from the Papaveracea, its leaves are less distinguishable, they are however under similar circumstances smaller; they are also coarser, and more obtuse in their terminations, and more rugose in their surface. Seedlings have been raised from this variety in the Royal Gardens at Kew, and in various other places, whose flowers have exactly corresponded with their parent. The first figure which appeared of this variety was in 1807, in the Botanist's Repository, tab. 448, where it is called Pæonia suffruticosa flore purpureo; the flower is represented as not very full, and is indifferently executed. In 1808, Dr. Sims published a figure of it in the Botanical Magazine, tab. 1154, which is defective, in giving too much of red in the dark colouring of the petals, and too little paleness to them generally; the date of the introduction, in the account annexed to this, is erroneous.* Another figure of it has been recently

* I am inclined to believe that a confusion exists between the two varieties of Banksii and Rosea, in the account and figure, given in the Botanical Magazine, folio 1154. The figure is more like the Rosea; and the date (1794) given of the introduction, agrees nearly with the fact as regards the Rosea; yet, in the account in the letter-press annexed, Sir Joseph Banks is mentioned as the introducer, which circumstance is only referable to the Banksii; besides, the plant from whence the drawing is stated to have been taken, was growing in a separate building in Mr. Greville's garden at Paddington, and that was certainly the Banksii. This plant of Mr. Greville's, together with the whole of his collection, was subsequently purchased by Mr. Thomas Jenkins, of the Portman Nursery, in 1810, at the death of that gentleman.

published in the Flora Conspicua, tab. 13; but the details which accompany the figure, are in parts not perfectly correct. This Moutan was introduced from England into France in 1801, by Mr. BOURSAULT; and in 1803 it was in the garden of the Empress JOSEPHINE, at Malmaison, from whence, some years after, it was figured and described by M. BONPLAND in his Plantes Rares, tab. 1, page 1. This representation is very indifferent, and in the description, the Banksii is evidently confounded with the Rosea, of which an account and plate are subsequently given in the same work.

3. *Pæonia Moutan Humei.* Among the various plants brought from China, which have been considered identical with the variety last described, a slight difference in the flowers of some may be observable, but they have not been, however, as yet treated of as distinct varieties. Of these, I have particularly to notice a plant which was imported in 1817, by Captain GEORGE WELSTEAD, in the General Harris East Indiaman, and by him presented to Sir ABRAHAM HUME. From a blossom of it, a figure was published by Mr. BELLENDEN KER, in the Botanical Register, tab. 379, in 1819, and it is there called Sir ABRAHAM HUME's Tree Pæony. From the sample shewn to me in that year, I was of opinion that it was the same as the Banksii, and Mr. KER has recorded that opinion. In the present season, however, I have received more perfect specimens from Sir ABRAHAM HUME of it; and though I cannot but still consider it very near to the Banksii, yet there seem to be some differences which are worthy of notice; the peduncles are thicker and longer; the blossoms open about a fortnight sooner, in similar situations, and they are somewhat larger; they are uniformly more

abundant in petals, and have, especially, a bunch of long petals always rising from the middle of the flower. The figure given of it in the Botanical Register is, by no means, a good resemblance.

4. *Pæonia Moutan Rosea Semiplena.* The first plant of this variety is said to have been introduced by the late Right Honourable Charles Greville, about the year 1794,* and it blossomed subsequently in his garden at Paddington. The flowers are semi-double, cupped, not opening very widely; if fully open, they would have an expansion of from six to eight inches; the petals are large, of a fine deep pink, very slightly darker at their base, but not strikingly so, as in the other varieties before described; they are larger than those of the Banksii, and have a very satiny appearance; their margins are crisped, and occasionally notched in the centre. The germens are usually five; sometimes six, and occasionally more numerous, but they very rarely produce seeds; they are surrounded by the stamens, which appear conspicuously. The flower has a delicate rose-like scent, which abates, after it has been sometime open. The shoots of this variety, when they break out in the spring, have a reddish hue, but the advanced foliage does not retain the tinge. The petioles are green, not red; the folioles are of a paler green than in the other kinds, broader, less shining, and

* This date was given by Mr. Anderson, in the Linnean Transactions, Vol. xii. page 255, on the authority of the late Mr. James Dickson: it is possible that the introduction might have been one or two years later. I have heard it stated that Mr. Greville's plant was derived from that of Mr. Hibbert, mentioned in the succeeding page of this Paper. But it is possible, and I think probable, that Mr. Greville had two plants of the Rosea, the one imported, and the other from Mr. Hibbert's stock.

less indented; they are sometimes tinged with brown by the weather. The flowers in the above named plant, and in others similar to it, are uniformly semi-double; they are the sorts generally seen in collections. One especially, which I have frequently noticed in the Chinese-house in the gardens of the Earl of Essex, at Cassiobury, which was imported in 1813, always has semi-double flowers. I have not heard that any young plants have been raised in England from the seeds of this, or of the succeeding. A good figure of the semi-double Moutan Rosea has been recently published in Messrs. LODDIGES' Botanical Cabinet, tab. 1035.

5. ***Pæonia Moutan Rosea Plena.*** A sub-variety of the preceding, producing very double flowers, with similar foliage, has come under my observation. Plants of it are in the garden of the Horticultural Society, which were obtained from Mr. RICHARD WILLIAMS, of Turnham Green, who purchased the parent stock at the sale of the plants of GEORGE HIBBERT, Esq. of Clapham, at Mr. JOSEPH KNIGHT'S Nursery, in 1811. The original was an imported plant, and was obtained from China in 1795, as I have been informed, by Mr. JOHN ALLEN, who then lived gardener with Mr. HIBBERT. A figure of a blossom of this variety, from the Clapham collection, had been published in 1804, in the Botanist's Repository, folio 373, with the name of Pæonia suffruticosa; it is represented as quite double, and described as nearly scentless. It is also figured, and described by M. BONPLAND in his Plantes Rares, tab. 23, page 61. The flowers are as large as those of the Banksii, of an uniform rich pink, though the edges of the petals become paler after a time. The exterior petals are large and broad, notched deeply in the centre,

and with crisped margins; the interior petals are long and narrow, much jagged at the edges, very numerous, and they rise in the middle of the flower to a considerable height; the stamens appear mixed with the interior petals, and the germens are included in a membranous sheath. The scent is agreeable, but not so fine as in the semi-double variety. Semi-double flowers are often observable on the plant, at the same time that others quite double are produced, and sometimes, I have been told, all the blossoms produced in a season are semi-double. The imported plant of Mr. Hibbert first blossomed in 1796; it was then very weak, and the flowers it produced were nearly single; but in the following year they were very double, and continued so in succeeding years. The variety now described has, hitherto been supposed identical with that which precedes it. I consider, however, there is sufficient difference between them to justify their being separated; and I have therefore done so. In the account of this plant, in the Botanist's Repository above referred to, it is stated to have been introduced in 1794.

Notwithstanding the opinion above expressed on the difference of the two Roseas, I think it right to mention, that it is questioned by Messrs. Loddiges, to whose authority I am disposed to pay great deference. In the account of the figure of the Moutan Rosea, published in their Botanical Cabinet, and above referred to, as representing the semi-double variety, it is stated, that the plant from which the representation was taken, was originally obtained from Mr. Hibbert, and that it always produces semi-double flowers. Mr. Hibbert had certainly only one plant of the Rosea, which was that I have above described as having double

flowers; and I have heard that other plants, which are always semi-double, were derived from the same source. But notwithstanding the fact that some of the offspring of this double flowering plant have uniformly semi-double blossoms, yet as the original, as well as others produced from it, keep the character of bearing double flowers, I think the considering it as distinct is justifiable.

6. *Pæonia Moutan Rawesii.* A small plant of a Moutan was brought from China, by Captain RICHARD RAWES, in the Warren Hastings East Indiaman, in 1820, and presented by him to THOMAS CAREY PALMER, Esq. of Bromley, in Kent, in whose garden, in 1825, it shewed one blossom, which was not however perfected. In the present year, the plant produced several blossom buds; but from being exposed to the severe frost of the end of April, the flowers opened badly, sufficiently perfect however to enable me to give the following description of them. The bractes are longer, and more conspicuous than in any other variety I have examined. The calyx-leaves, instead of enclosing the bud in a globular form, are twisted up so as to come to a point at the top. The petals are not very unlike those of the Herbaceous Pæonia Cretica; they are pale, tinged very slightly with pink, and have a very satiny shining appearance; they are about twelve in number, ovate-oblong, concave, and much lacerated at the edges. The expansion of the flower, if fully opened, would be about seven inches. The filaments are purple, and short, the anthers consequently are clustered close round the germens, which are enclosed in a small bright reddish-purple membrane, the colour of which gives singularity to the flower. The germens are six in number, having

large curled purple stigmas. The foliage much resembles that of an Herbaceous Pæony; the leaves are in every way smaller and darker than those hitherto described, but the size may be in some degree owing to the small state of the plant; they are, as in the others, biternate, but otherwise very different; the lower leaflets are however sometimes simple, not ternate; the lateral folioles of the leaflets are simple; the terminating foliole is divided deeply, often very unequally, and sometimes, though rarely, that of the upper leaflet is cleft to its base. I have named this variety in compliment to Captain Rawes, whose success in bringing home plants from China, in his different voyages from that country, has been so great, that he probably is intitled to be considered the actual introducer of more valuable plants from that country, than any other private individual whatever.

The plants hitherto described have been all importations from China, and are the only foreign ones, blossoms of which have fallen under my observation. I have some reason to suppose that another variety, with semi-double flowers, was a few years ago in the garden of the Comte de Vandes, at Bayswater, but it has ceased to exist there. Other instances have come to my knowledge of the supposed existence of new Moutans introduced from China; but until the flowers have appeared and been examined, it would not be safe to state them as distinct.

The seedlings which I mentioned at the commencement of this Paper, were raised in the garden of the Earl of Mountnorris, at Arley Hall, in Worcestershire; the seeds were from the Banksii, and were sown seven years ago. In the year after they were sown, three plants came up. One

is a very distinct variety, the two others approach each other so nearly, that they will not perhaps be considered sufficiently different to be separated, except by very nice observers. As the flowers of those now to be described are the first they have produced, it is probable that they will very much improve in size hereafter. The plant of Banksii, which produced the capsules from which the seeds were gathered, grew close to a Papaveracea, and from the characters of the flowers of their produce, I am disposed to think that they are derived from the pollen of the latter.

7. *Pæonia Moutan Carnea Plena.* I have given this name to the first of the two plants which I have stated are nearly similar to each other; the difference between them principally consists in the ground colour of the petals, which in this is of a delicate purplish pink. The blossoms are large, very double, with a great resemblance in character and appearance to those of Banksii, except that they are less, more compact, and that they are without the central elongated petals, which sometimes in that variety appear to rise from amongst the germens. I think, however, some disposition towards this is observable in the specimens I have examined of the next variety. The petals in both are also generally smaller, and more abundant than in the Banksii; they also have a rich purple rayed spot at the base of every petal; these spots are exactly similar to those in the flower of Papaveracea, except that they are smaller. From the fullness of the blossom, these spots are not so strikingly observable as in the Papaveracea. In the variety now under notice the germens are numerous, and are at first covered with a purple membrane, that subsequently bursts.

8. *Pæonia Moutan Albida Plena.* The petals of this are very pale, though not decidedly white; the colour suffused into them is purplish. The germens are numerous, and are covered with a dark purple membrane, which continues to surround them, and does not burst. The blossoms of this were the largest of the two, and the plant seems to be altogether stronger, and more vigorous.

9. *Pæonia Moutan Anneslei.* This very distinct and pretty Moutan, is named in compliment to Lord MOUNTNORRIS, to whom the credit of being the first who has raised and brought into notice seedling varieties of Moutan in Europe, will be added to the many other obligations that Botanists and Gardeners are under to him, for his continued and valuable exertions in the introduction and cultivation of many of our best exotic novelties. The blossom of this plant is small, not exceeding four inches and a half in diameter, when expanded. It is almost single; the specimen which I received had only nine heart-shaped petals, slightly jagged at the margins, of a rich purplish pink, their bases being of a rather darker purple, rayed towards the middle of each petal, and extending in a line up its centre to the notch at the apex. The stamens are of unequal length, and numerous, and the germens are enveloped in a covering, as in Papaveracea. The accompanying figure has been made by Mr. WILLIAM CLARK, from the specimen described.

These are the different Moutans now growing in England, which I proposed to notice. It will now be not without amusement, and certainly useful, to point out what other varieties are in China, which are deserving of introduction.

Pæonia. Moutan. (Anneslei)

I place no reliance on the statements of the great number, and of the very different colours, of the varieties represented to exist, by the authors of the account of the Moutan in the Mémoires sur les Chinois, already referred to, and subsequently more particularly to be noticed. That many and very desirable kinds, are yet to come from China, cannot be doubted. The only good evidence of the existence of particular varieties, must be derived from original Chinese drawings; but these are usually so inaccurately executed, and the artists who prepare them are so little to be trusted, that much caution must be used in determining that the figures are those of existing plants, and if so, then that they are correct representations. In most instances, and especially in the collections of drawings sold to the traders and other visitors at Canton, the plants are imaginary.

Five drawings of Moutans, executed at Canton, are in the library of the East India Company, and copies have been made from them for the use of the Horticultural Society; they are all deserving of consideration. Four of these originals were made in 1806. The two first are referable to our Banksii and to our Double Rosea; the resemblance to the former is however very imperfect. The third is called the *Tsū* Moutan,* and has fine double purple blossoms; it is considered a very handsome variety; the whole plant and flowers are larger than any of the other sorts, and its habit is very conspicuously distinct. The fourth is the *Pae Moutan,* with double white flowers; this differs very much from all others which have been seen at Canton, not only in the colour of

* The Chinese appellations of *Tsū, Pae,* and *Wong,* given to these Moutans, are indicative of the colours of the blossoms.

the flowers but in the habit of the plant; it is much more slender and delicate. Both these last are very scarce, and the white one is not only the rarest, but is the most highly esteemed. These two are the kinds to which the enquiries of persons collecting Moutans at Canton should chiefly be directed. I have been informed by Mr. Reeves, that one of the Double Purple Moutans was purchased a few years since by an American Captain, in order to be carried home by him; but it probably perished in the voyage, for I have not heard of its being in the United States. The fifth drawing of the East India Collection was made subsequently to the others; the plant figured is called the *Wong Moutan Fa*, and is represented as having a double yellow flower. The drawing is said to have been taken from a plant which flowered in the house of a Mandarin at Canton, in February, 1810. This statement, however, is not credited, and the existence of a Yellow Moutan, is altogether disbelieved by those best capable of forming a judgment on the subject.

The drawings executed in China, for the Horticultural Society, under the direction of Mr. Reeves, are to be depended on for their accuracy. Two are the Papaveracea, and the Double Rosea. Besides these, there are the following; the plants which they represent have yet to be introduced:—1st. a semi-double white, of no great merit; 2nd. the Double Purple, similar to that figured in the East India Company's collection; 3rd. a small purplish red, with pale edges to the petals, with the germens enveloped in a pale membrane; and, 4th, a very double pale red, with the interior petals small, and closely packed together. The Horticultural Society has also two other drawings, copied from two Chinese

originals in the collection of Lady BANKS, which have every appearance of being correct representations; one is a very rich deep red, the other white, having a tinge of green, with also a delicate blush at the base of the petals; both of them double flowers.

A very elaborate, but in many parts both fabulous and mistaken account of the Moutans is given* in the Mémoires sur les Chinois, the substance of which I will briefly note. They are stated to be of considerable antiquity in the gardens of the north of China, and are supposed to have been originally found wild on the mountains in the province of Ho-nan. They were at first cultivated in the district of Lo-yang, and subsequently in the Imperial Gardens of Kai-fong-fou, in Ho-nan; but they appear to have succeeded best in the province of Hou-Kouang, from whence they are now supplied to the gardens of Pekin, and other parts of the Empire. They are stated to have received various names, as *Hoa-ouang*, or *King of Flowers, Pé-leang-kin*, or *Hundred ounces of gold* (from their value), and *Mou-chao-yao,* or *the Tree Pæony,* to distinguish them from the Herbaceous Pæonies. It is represented that Moutans have been cultivated frequently of various heights, from very dwarf plants, to trees of twenty-four feet high, and that different varieties have existed, which produced their flowers at different seasons, some in winter, and some in autumn; but the spring flowering varieties are those now in cultivation. These are said to be very numerous, with flowers of various degrees of fullness, from semi-double to very double, and of the following colours, "*rouge, violet, pourpre, amaranthe, jaune, blanc,*

* Vol. iii. page 461.

noir, et bleu" in great variety. Some are represented to possess considerable fragrance. Accounts of the way of cultivating the Moutans in China are also given; they appear to be propagated from seed, and by other modes of increase which will be noticed hereafter. I do not place much reliance on the correctness of the details in this memoir, which extends to several pages; and I am incredulous, not only as to some of the colours of the flowers, which are said to exist, but also as to the extent in number of the varieties.

The provinces and places above mentioned, are in the northern and central parts of the Chinese Empire, and the habits of the Moutan evidently exhibit an high mountainous, or alpine origin, subject to being buried under snow during the winter. They make strong shoots early in spring, and break rapidly into foliage, and blossom.

In the description of China, published by DUHALDE, in 1753, very little notice is taken of the Moutans; they are described* under the general name of *Pivoines*, as being of different colours, and some of them fragrant. A brief notice of the Moutans in the gardens at Canton, will be found† in Dr. ABEL's Account of Lord AMHERST's Embassy to Pekin in 1816; but it contains no information respecting them which is not herein stated. They are not mentioned, as far as I have discovered, in the accounts of other travellers in China.

It must be concluded that the Moutans were transferred from China to Japan, where they are cultivated; but they do not appear, however, to have been introduced in much variety into the latter country. KÆMPFER, in the fifth fasciculus of his Amænitates Exoticæ, printed in 1712,

* DUHALDE, Description de la Chine, Tom. i. page 24. † Page 220.

describes the plants of Japan, and (page 862) among them the *Botan*, as a species; but does not mention any varieties. He distinguishes it by its woody stem from an Herbaceous Pæony called *Saku Jaku*, of which he names three varieties. THUNBERG, in his Flora Japonica, printed in 1784 (page 230), confounds the *Saku Jaku* and *Botan* together, referring both, most absurdly, to the Pæonia officinalis of LINNÆUS, and states that they are cultivated in every garden of Japan. The Saku Jaku of KÆMPFER is, according to the printed opinions of those who have attended to Pæonies, referable to the species well known in our gardens as P. albiflora, though neither of the varieties mentioned by him have white flowers.

LOUREIRO, in his Flora Cochinchinensis,* has created much confusion on the subject of Pæonies. His only species is called P. officinalis. He names two varieties of it; one with a red, the other with a white flower, both apparently herbaceous, for notwithstanding his use of the terms *caulis suffruticosus* in his general character, every other part of it is referable as above stated to P. albiflora, of which I am inclined to think he intended to describe two double varieties. His account of his Pæony is, that it grows both wild and cultivated in the Chinese Empire, especially in the northern provinces, and that it was introduced from China into Cochin-china. He states, besides, that there "are many varieties," perhaps species, "which he has not seen."

All the Moutans are sufficiently hardy to bear exposure in the open ground in the winter. The Banksii has been considered the hardiest; but neither that nor Papaveracea

* Edit. 1, anno 1790, page 343. Edit. 2, à WILLDENOW, anno 1793, vol. i, page 419.

appear to suffer from frost, and they are, consequently, frequently planted in the borders of gardens; they will all grow in a northern aspect, and perhaps such a situation may be better suited to them, than one where they would receive more of the direct influence of the sun. But though they are not hurt by the severity of winter when planted out, the chilling blasts of our springs have very injurious effects on them, and both the leaves and flowers are often cut and injured when entirely unprotected at that season. From this cause, those who desire to have them in the greatest perfection, give them a covering of glass, under which the beauty of the blossoms and the delicacy of the foliage is perfectly preserved. They ought however to be planted in a border, in preference to being kept in pots. Warmth from fire or steam is not necessary to them; they are brought earlier into flower by heat, but not improved by it. The best mode of protecting them, and at the same time of having them in perfection, is that of glass frames, or houses without flues; these may be made of any dimensions that fancy may require. The first plants of the Banksii which flowered in the Royal Gardens at Kew, and in that of the Honourable Charles Greville, at Paddington, were thus sheltered, and a covering of the same character has always been kept up over the original Papaveracea at Wormleybury.

The propagation of Moutans, upon their first introduction, was a matter of considerable difficulty; they have, consequently, borne a high price in the nurseries; and though they are now multiplied extensively, yet, with all the experience which has been acquired, the obtaining strong new plants of them is a tedious operation. All modes of

propagation have been tried with them, viz. by seeds, suckers, grafts, cuttings and layers. They rarely produce perfect seeds, bu t would probably do so more frequently, if the impregnation of the stigmas was properly attended to. The seedlings which have hitherto been obtained, as may be observed from the accounts of such in the former part of this paper, are but few. Suckers, or rather root-shoots, may sometimes be severed successfully from large old plants, and such soon become strong enough to flower. If the work is carefully executed, grafts of the rarer sorts may be fixed on pieces of the roots of the more common. These pieces of root must be established in pots, and in the spring a bud, with a little wood attached to it, may be joined to the root in the manner of a graft, a slice of the root being taken off to receive the piece intended to be united to it. When the fitting is completed it is to be covered with clay, taking care to leave the eye exposed; the pot must be kept covered with a hand-glass. Trials have been made of a plan of grafting the Moutan on roots of Herbaceous Pæonies, as suggested by Mr. Knight, the President, in the first volume of these Transactions,* and I have heard that it has sometimes succeeded, but not sufficiently to encourage the practice generally. I have not witnessed the operation, but have been informed that it is performed by attaching a short slip of a branch of a Moutan, on which there is a bud, to the succulent tuber of an Herbaceous Pæony, binding them tightly together, sinking them below the surface of the earth, and covering them with a glass; the tuber supports the graft until it emits roots sufficient to maintain itself independently.

* See Horticultural Society's Transactions, Vol. i. page 240.

Ripe cuttings taken off in August or September, with a small piece of the old wood at the end, and planted against the sides of garden pots, in a mixture of loam, leaf mould, and sand well drained, and protected from the air by glasses, will succeed. The pots must be kept secured from the frost in the winter, and shaded in the summer; in the spring, the progress of the cuttings may be assisted by being placed in a frame with a gentle bottom heat. But the most general plan of multiplying Moutans is by layers, the shoots for which purpose should be planted either in protecting pits, or, in sheltered borders, which should be covered with mats spread over hoops; the branches when laid down, require a longer time than is usual with common shrubs to emit roots, and the largest are seldom fit to be removed till they have remained two years attached to the stool. The soil used for this operation is good rich loam, made light by a considerable mixture of sand, with the addition of one-fourth part of heath mould. The shoots when laid down require to have a longitudinal slit, or tongue, made in the inner side of the bend; and this must be done with care, for, being brittle, the wood is liable to break; the tongued part should be bedded in a mixture of loam and sand.

In addition to the above, it may be interesting to know the nature of the methods of propagating the Moutan in use among the Chinese. Upon this subject we have no information, except from the accounts in the Mémoires sur les Chinois, before alluded to. According to these, the modes of propagation, exclusive of that by seeds, are three-fold, viz. by suckers, by splitting the stem, or by grafting.

When suckers are produced by an old plant, the earth is

carefully removed from about its roots, which are laid bare till the whole of the union of the sucker with the parent root is uncovered. They are then separated, but the wound of the old plant is suffered to remain exposed for a day or two till its surface dries; dry earth is then placed about it, and care is taken that no moisture is applied for the space of a fortnight afterwards. The young sucker is enwrapped in fresh leaves, in which state it is kept till the lower end becomes shrivelled, and so much contracted, that the two opposite sides touch each other. It is then planted in rich earth, which is rather dry than otherwise, and kept well shaded till it has rooted, care being taken to guard it from frost.

When the operation of splitting the stem is performed, an old plant is selected, and its stem is regularly slit into four or six equal portions, from the top to the very bottom, among the roots; the divisions of the stem are kept apart until the wounds begin to dry, when the middle of the stem is filled with a sort of plaster, made with mortar *(mortier)* and rich earth, among which is mixed fat and a small quantity of sulphur. The plant so prepared is suffered to remain till the autumn, when each division is fit to be separated, with the portion of the root belonging to it.

Grafting is practised on the roots of the more common Moutans; when this is attempted, the root of the stock is laid bare during some weeks, to the depth of three or four inches; just before the autumn shoot is made, the earth is again heaped about the root, and soon afterwards, when the sap appears in full motion, the operation is performed. This is done in the way we call crown grafting. A kind of clay

made with rich mould, formed into a sort of mortar with the expressed juice of Herbaceous Pæony roots, is then applied about the scion and stock. The plant is afterwards shaded from the sun, and protected from frost during winter; and, when the spring arrives, it is left to take its chance. If the scion ever pushes, all danger of losing it is past.

LV. *Report upon the effect produced on certain Plants in the Garden of the Horticultural Society, by the Frost which occurred during the Night of April* 29*th*, 1826. *By Mr.* JOHN LINDLEY, *F. L. S. &c. &c. Assistant Secretary for the Garden.*

Read June 20, 1826.

ON the night of the 29th of April, 1826, after a long series of fine weather, which from the commencement of the month had been only interrupted by a refreshing fall of rain on the 11th, to the depth of half an inch, and during which the days had been warm, with serene weather and a temperature varying from 52° to 68° at noon, there occurred one of those severe and unforeseen frosts which are too often fatal to early vegetation in this climate. Plums, Cherries, and Strawberries were in full flower, Pears were setting their fruit, and a few Apples had begun to expand their blossoms; the young shoots of the Vine, the Walnut, and the Ash,, had pushed to the length of several inches; and the produce of the Kitchen Garden was, from the previous rapidity of vegetation, in a state of high susceptibility.

The day of the 29th of April was cold and cloudy, with a brisk north wind; the thermometer in the shade did not rise higher than 51°; in the evening the sky became clear towards the north and west, and the wind was sufficiently high to prevent the formation of dew; at nine in the evening the dew point was 30°, and the temperature 32°; but towards morning the wind fell, the sky became very clear, and at

sun-rise a thermometer suspended from a north wall, under the protection of a coping, was observed to stand at 29°; the dew point at six in the morning was 32°, with a temperature of 40°. The real degree of cold during the night was, however, considerably greater than was indicated by the thermometer upon a north wall. In an instrument used for ascertaining the degree of cold to which a body is exposed, so isolated, as to be as far as possible out of the influence of radiation from surrounding objects, the mercurial column was depressed to 19°, an intenseness of cold which, as will be hereafter seen, some of the hardiest of our forest trees are incapable of enduring when in a state of vegetation.

The following is a List of the various Plants which were injured by the Frost.

TREES AND SHRUBS.

Azalea viscosa
——— versicolor.
——— nudiflora.
——— glauca.
Robinia Pseud-acacia; all the varieties.
——— hispida.
Fraxinus; all the species except parviflora and horizontalis, and especially
Fraxinus nana.
——— Theophrasti.
——— excelsior.
——— excelsior verrucosa.
Cercis Siliquastrum.
Ailanthus glandulosa.

Gleditschia macrostachya.
———— triacanthos.
———— macrantha.
———— horrida.
———— Chinensis.
Kölreuteria paniculata.
Amorpha fruticosa.
Juglans; all the species except J. nigra, and especially
Juglans fraxinifolia.
——— regia.
Castanea vesca.
——— pumila.
Celtis cordata.
—— Tourneforti.
—— orientalis.
Sophora Japonica.
Salisburia Adiantifolia.
Chionanthus maritima.
Rhus Cotinus.
—— radicans.
Clethra nudiflora.
——— pubescens.
——— nana.
Stuartia Marilandica.
Magnolia Thomsoniana.
——— cordata.
——— tripetala.
——— acuminata.
Platanus occidentalis.

Platanus orientalis.
——— cuneata.
Aristotelia Macqui foliis variegatis.
Aralia racemosa.
Pinus Cedrus.
—— Clanbrasiliana.
Glycine Sinensis.
Vitis odoratissima.
Chimonanthus fragrans.
Hydrangea hortensis.
Acer campestre variegatum.
Morus alba.
——— Canadensis.
Populus grandidentata.
Prinus verticillata.
—— Canadensis.
Cornus circinata.
Vaccinium album.
Broussonetia papyrifera.

Fruit-bearing Plants.

Apricots.
Plums.
Apples.
Pears.
Cherries.
Strawberries.
Gooseberries.
Red Currants.

White Currants.
Black Currants.

Esculent Vegetables.

Rhubarb.
Potatoes.
Asparagus.
Peas (slightly).

Upon considering the above list, it is impossible not to observe the very unequal manner in which plants from similar countries, or with similar physiological structure, were affected by the frost. As it is not impossible that, by data of the above nature, some light may be hereafter thrown upon the mysterious connection which exists between temperature and vegetation, it may be useful to add to this Report, such remarks as, with the limited state of our knowledge, suggest themselves.

And, firstly, it is deserving of notice, that the same degree of cold which was fatal to the Asparagus, a native of the sandy coasts of this country, produced scarcely any effect upon the foliage of the Gooseberry, Currant, Rose or Raspberry, all inhabitants of our woods and thickets; yet those plants in their native places would be subject to the same vicissitudes of temperature, and to the same degree of occasional cold; the young shoots of the Rose, at least, are moreover as vascular as those of the Asparagus, and apparently liable in the same degree to the action of frost.

While the True Robinias, that is to say those plants which have the Botanical characters of Robinia, strictly so called,

and which are the Locust trees of the Americans, had their young shoots universally destroyed, no effect whatever was produced either upon the Caraganas of Dahuria or of northern China, or even upon the Halimodendron, whose most northern limit in the arid plains about the Irtysch in 46° or 47° N. latitude, can scarcely be considered so cold as the most northern range of the Locust-tree on the mountains of Upper Canada. This constitutional difference between the Robinias and Caraganas, may perhaps be considered a confirmation of the propriety of admitting the modern opinion of their being generically distinct.

The same cold which entirely destroyed the blossoms of Azalea viscosa, and of the other American Azaleas, scarcely affected Azalea Pontica; and yet the geographical range of the former ones reaches as high as 50° N. latitude on the mountains of Canada, while that of the latter does not advance farther than 44° north on the lower regions of the precipices of the Caucasus.

All the species of Fraxinus, even the F. excelsior of this climate were killed as far as they had vegetated, with the exception of F. horizontalis and F. parviflora. Of these, the latter, although its native country is not well ascertained, can scarcely be referred to a higher latitude than 40° or 42° north; and the former is a garden variety, the origin of which is unknown, and which, indeed, is scarcely different from F. rotundifolia.

The same remarkable circumstance was observed in the genus Juglans, of which the only species that was uninjured was J. nigra, which is stated by Pursh to extend from New England to Florida, and which suffered no injury, while

similar plants of the Canadian J. cathartica were nearly destroyed.

Anagyris fœtida, a native of the southern parts of France, and of the coasts of the Mediterranean, was finally destroyed, having been damaged by the previous winter, while the Anagyris Indica, a native of Nepal, sustained no injury whatsoever, and while Vella Pseudo-cytisus, Dorycnium Monspeliense, natives of the same localities as A. fœtida, and even the Aristotelia Macqui of Chile were unharmed.

Duvaua dependens, a Chilian shrub, Pistacia Lentiscus, and some other Terebintaceous plants, while in full vegetation, were scarcely affected by the 13° of frost above alluded to, although numerous plants from the same countries, with the same sensible qualities and natural affinities were lost during the winter, even while in a state of torpidity.

The variegated variety of Acer campestre was damaged, while the common wild kind was uninjured. This and the variegated variety of Aristotelia Macqui, are the only instances which were noticed of the variegated variety of a hardy plant being more tender than its parent.

All trees upon walls which had copings were perfectly protected, excepting those whose shoots projected beyond the perpendicular influence of the coping; under such circumstances the shoots of Vines were quite cut off.

Upon inspecting the young fruit of such trees as were at the time in blossom, it appeared as if no injury had been sustained by their flowers; but upon examining them more minutely, it was ascertained that their ovaria were black with death, and it subsequently was seen that fruit, so affected, all fell from the trees and perished. It was also remarked that,

in the blossoms of the Strawberry, it was the ovaria which were destroyed, and that the stamens were but little injured. This therefore shews that the ovarium of fruit is so delicate in its organization, that a degree of frost which is incapable of affecting the fleshy calyx, the petals, or the stamina immediately enclosing it, will entirely destroy the ovarium through all those envelopes; and that the ovarium once affected, no power is left in the uninjured calyx, even of the Apple or the Pear, whose fruit is the consequence of the enlargement of that organ, to proceed further in its growth. It also appeared, especially with the Pears, that the fecundated ovarium was more susceptible of cold than that which was unimpregnated.

LVI. *On the* Propagation of Zamias. *In a Letter to the Secretary. By Mr.* Francis Faldermann, *Chief Gardener in the Imperial Botanic Garden at St. Petersburgh, Corresponding Member of the Horticultural Society.*

Read August 15, 1826.

Sir,

Having lately made a discovery with regard to the propagation of Palms, I consider it my duty to inform the Horticultural Society of it, trusting that it may prove of considerable utility to cultivators.

We had in the Imperial Botanic Garden a fine healthy plant of Zamia horrida, which suffered in the inundation of November, 1824. Last autumn it began to sicken, to my great sorrow; it then lost its roots, and was to all appearance quite dead; the leaves and heart became entirely rotten, so that it appeared like a tube, and was only kept together by the hard scales formed by the bases of the leaves, many even of which were beginning to decay.

In this state I took the plant out of the pot, though without hopes of being able to save it, and having kept it for a

few weeks in a dry place, I filled the inside, after having cut out all the rotten parts, with white sand, and placed it under a bell-glass, upon the bark bed, in a shaded situation. It stood in this state about three months, during which time I observed that the sand prevented any further decay. At the end of this time on lifting up the bell-glass one day, I found that almost every scale was pushing small leaves and roots! Upon this I carefully separated each of the growing scales, and placed them singly in small pots, in pure white sand, in which they are at present thriving.

Thus I have obtained a great number of plants of this rare and valuable plant, which is the more gratifying, as it is a species which I believe has not been propagated in Europe, and certainly never by artificial means, in any part of the world; in consequence of which it has always borne a very high price, and sometimes could not even be procured.

The circumstance which led me to try this experiment was a similar accident with the bulb of a Veltheimia, the heart of which was in like manner rotten, and nothing of it remained but a few of the outside scales. After having kept it about three weeks in a dry place, I filled the inside with white sand, and in six weeks time I found the surviving scales began to push forth leaves; they soon became young plants, and some of them were lately in flower.

The chief thing which I have found necessary to be observed, is to keep the plants after the inside has been filled with sand, in a very dry and warm situation; if this be attended to, I have no hesitation in assuring you that success will attend a trial of the practice.

In order to afford a clear idea of the manner of developement of the young Zamia from the scale, I send herewith a drawing of one of them, which was made by the order of Dr. Fischer, by Mr. Matthes, the painter to the Imperial Botanic Garden.

It will be extremely flattering to me, if the Society should think this little notice worthy of insertion in their Transactions; that would be the surest means of bringing it

to the knowledge of the public, and of rendering it available to those to whom it may be useful.

With the utmost esteem,
I am, Sir, your very humble,
and obedient Servant,
FRANCIS FALDERMANN.

Imperial Botanic Garden,
St. Petersburgh, April 20, 1826.

Note by the Secretary.

The Council, in ordering the foregoing paper to be printed, think it necessary to state, that they are aware that a practice has been employed in this country, of propagating both Zamia and Cycas, by destroying the heart of the stems; but as the method is only partially known, they conceive that the publication of Mr. FALDERMANN'S observations is desirable.

LVII. *Description of* Stoves for the growth of Melons and Cucumbers. *In a Letter to the Secretary. By Mr.* John Haythorn, *Gardener to the Lord* Middleton, *F. H. S. at Wollaton Hall, near Nottingham.*

Read February 21, 1826.

Sir,

In compliance with your desire, I send you the plans and sections (See Plate VIII.) of the houses or stoves in which I grow Melons and Cucumbers at this place, and can assure you that the mode of cultivation practised in them, answers well. Figure 1, shows the ground plan of the two stoves which adjoin each other; figure 2, is the section of that on the west, in which Melons are grown; figure 3, is the section of the eastern stove, which is used for Cucumbers. The stoves are each twenty-three feet long, and nine feet wide within the walls. The outside walls are six feet and a half high, and are sunk very considerably below the level of the outer soil; the ground being uneven in which these stoves are built, the height of the walls above the ground line, varies from three feet to fourteen inches.* The descent into the stoke-holes, in which are the fire places, is from the back, and the doors into the stoves open from these stoke-holes. The flues pass from the fire place along the front by one end and the back of the house to the chimney, which is close to the steps which lead into the stoke-hole. Between the flues and

* Provided the bottom be dry, it is an advantage to sink these stoves below the level of the earth; they are much warmer in consequence.

the outer walls, all round are cavities, carried higher than the tops of the flues, for the admission of the heated air to the interior of the house. The tops of these cavities are covered by bricks made to slope upwards towards the wall, for the purpose of preventing dust and rubbish getting into and choking them. The air is let into the houses from them, by means of holes near the top, left at intervals of one brick all round in the inner wall, which forms the cavities. The roofs incline north and south, as is represented in the sections, the ridge being supported by pillars of wood from within. The stoke-holes are open, but they would be better if they were covered, and the roofs slated; they also want the convenience of a small chamber, in which to deposit the coals, which might be easily made outside of the main wall, and accessible through an arched opening in the wall.

The Melon stove has a pit in front, a border at the back, and a path between the pit and border. The pit is formed by a nine-inch brick wall at the back, and by an inclosure over the flue at the front, (see figure 4). The horizontal part of this enclosure (see figure 5) is made of large flue tiles, supported at intervals by pieccs of bricks on edge, placed on the top of the flue, and by bricks built into the front wall at the proper height. These support the coverings, care being taken in the placing them to leave space for the passage of the heated air upwards. The top of the front flue is formed with hollowed tiles, on which water is poured for the purpose of raising steam, by means of pipes which pass through the outer wall.* In the pit the larger sorts of Melons are grown.

* The flue and its covering being carried under the pit, is inconvenient, both because it occupies too much space there, and because it is difficult of access for the

The back and front walls of the back flue, are carried up with a brick on edge, so as to make a border for earth over the flue; an interval or cavity being formed between the top of the flue, and bottom of the border. Holes capable of being stopped with plugs, are made into this cavity, (see figure 8). The top of the flue in the cavity under the border, is covered with sand to receive water, when poured into the cavity through the plug-holes. Under the back glass of this stove, wires six inches apart, supported from the rafters by short stronger wires, with eyes at the ends, are carried horizontally, the whole length of the houses, at eight inches from the glass. To these wires the smaller sorts of Melons, which are grown on the border over the flue, are trained.

The Cucumber stove has borders over the front, as well as the back part of the flue, similar to the one at the back of the Melon stove; the middle part of the stove is vacant, and the Cucumbers which are grown in the two borders are trained on wires, similar to those in the back of the Melon stove under the whole of the glass. In this stove, on the top of that part of the flue which is at the end, a trough is formed by bricks set on edge to hold water for the purpose of evaporation.

The larger sorts of Melons are kept in bearing through the usual season, in the same way as in other Melon pits. The smaller sorts of Melons are planted in the border, and trained to the wires from whence the fruit grows suspended; they succeed admirably. When these last Melons are planted

purposes of repair and cleaning. It would be a great improvement if the front wall was built with arches opening to the internal cavity and the flue, and carried outside the house. A plan of this projected alteration is annexed, (see fig. 6 and 7). If the house was not double, the flue at the end might also be carried outside.

early, the first crop is gathered by the end of June, at which time young plants being ready to replace them, a second crop is obtained on the wires before the end of the year. Fresh earth is requisite for the second crop. It is necessary at all times to water the Melons in the border daily; in the pit watering is discontinued during the time the fruit is setting, but after that period, plenty of bottom watering is supplied.

The Cucumbers are kept in bearing from the month of February, when they begin to produce, to the January following, when new plants are introduced.

The essential point to attend to in this practice, is the keeping up constant humidity, with proper heat in the stoves. The addition of a boiler over the fire place, from which steam might be conveyed in pipes into the stoves, would be an improvement. The plants are syringed night and morning; the floors of the stoves are then also plentifully watered, and water is likewise at the same time poured upon the hollows over the flues, and into the sand on the tops of the flues, the plugs being removed; thus keeping down the Red Spider and Thrips. The Cucumbers require more steaming than the Melons. The holes in the cavities under the borders are stopped in the day time, to confine the heat below the borders.

After the Cucumbers have been planted, they are earthed up; the depth of the border is increased for this purpose, by setting bricks on edge, on the curbs of the border. This increase of the mould enables the plants to put forth fresh roots from the covered part of the stems, which greatly invigorates them.

Fig. 2

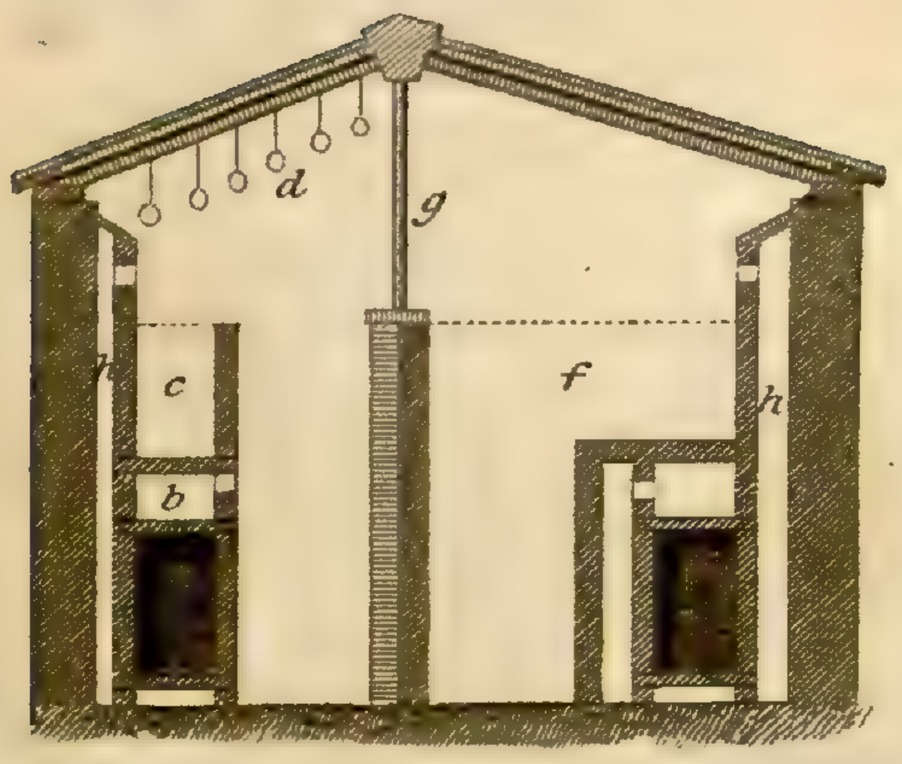


Fig. 8

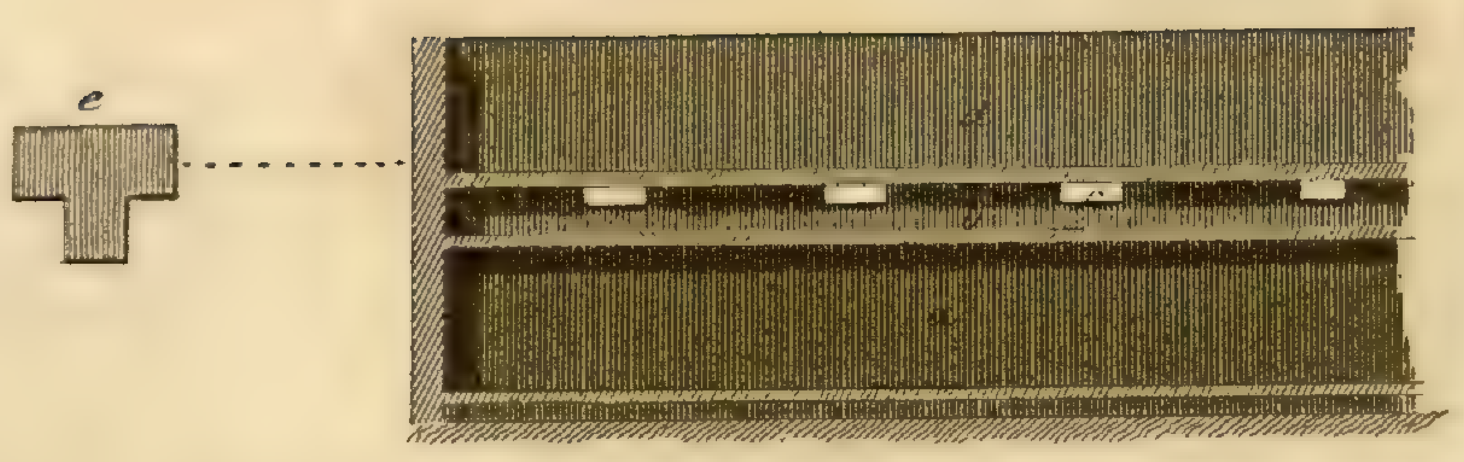


Fig. 3

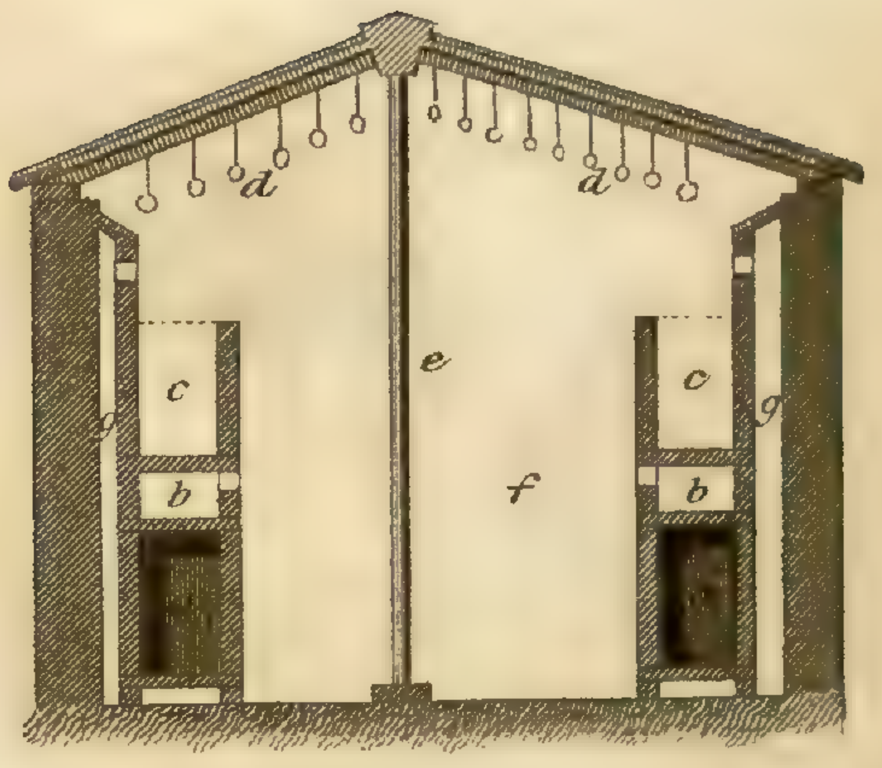


Fig. 1

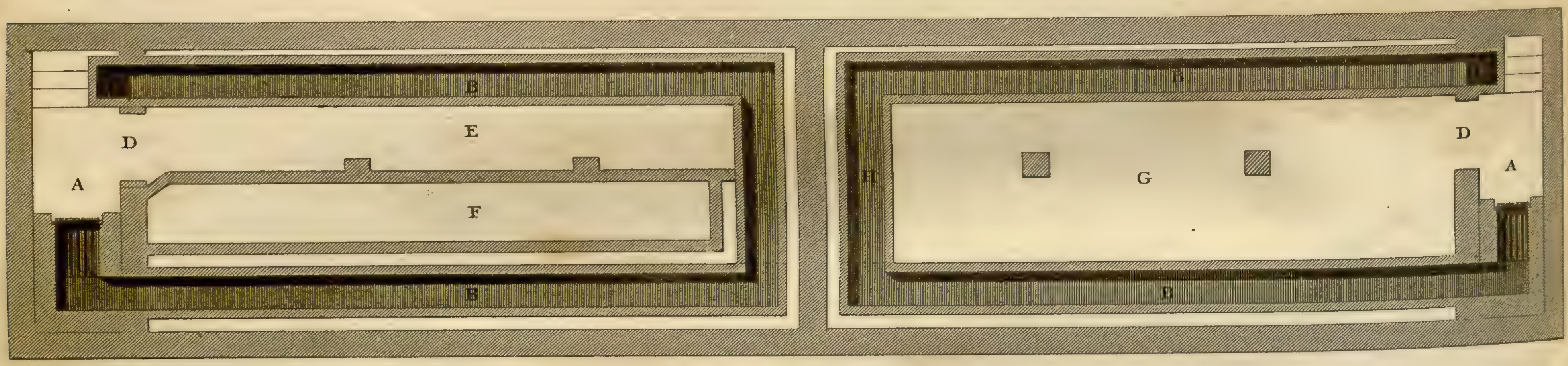


Fig. 4

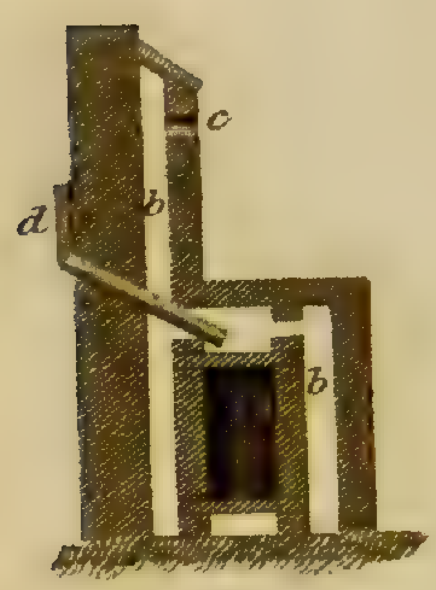


Fig. 5

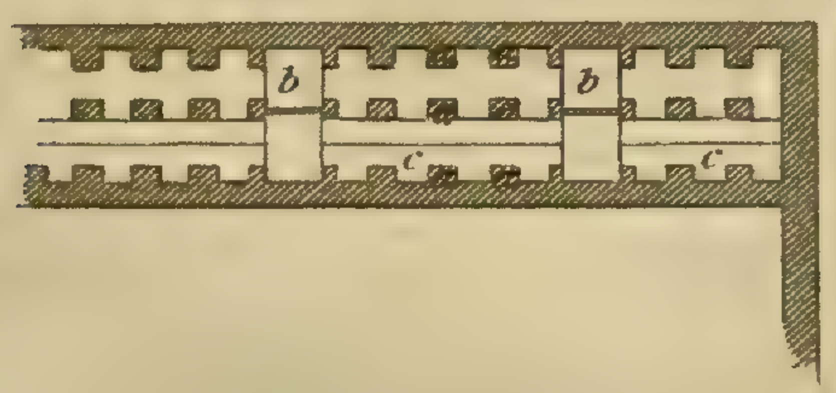


Fig. 6

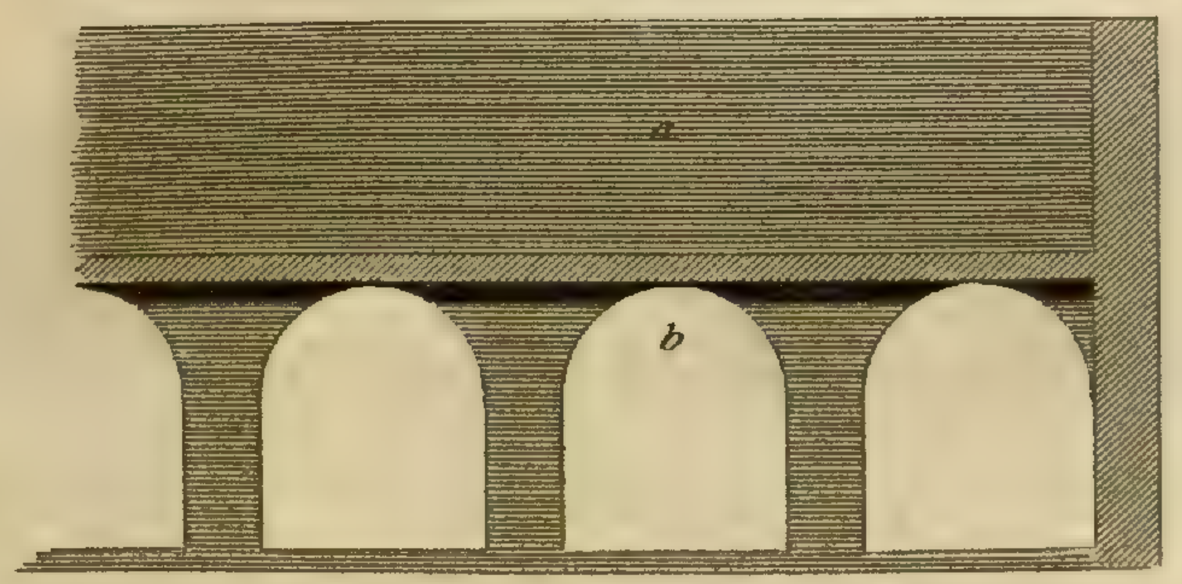
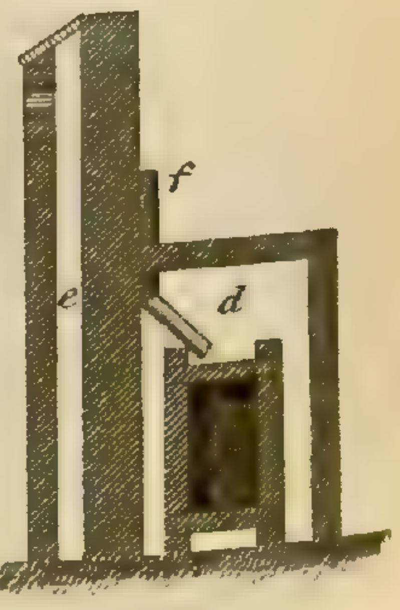


Fig. 7



0 5 10 20 30 feet

Stoves for Melons and Cucumbers at Wollaton Hall.

J. W. Lowry, sculp.t

At the commencement of the season, before filling the pits and borders, I whitewash every part of each stove, which not only makes it clean and neat, but destroys insects.

I am, Sir,
your very obedient servant,
John Haythorn.

Wollaton Hall,
January, 2, 1826.

Explanation of the Plate.

Fig. 1. Ground Plan of the two stoves.

A Stoke-holes and fire-places.

B Flues.

C Chimneys.

D Doors of entrance to the stoves.

E Path in the Melon stove two feet wide, with piers projecting into it for the pillars which support the ridge of the roof.

F Melon Pit, shewing the wall which supports the top of the chamber over the front flue, which is covered by the pit.

G Vacant space in the Cucumber stove, with pillars to support the ridge of the roof.

H Part of the flue covered with a trough for water.

Fig. 2. Section of the Melon stove.

a Back flue.

b Cavity over the flue.

c Border.

d Wires to support the plants of the smaller kinds of Melons.

e Front flue.

f Pit for the large kinds of Melons.

g Pillars to support the ridge of the roof, standing on piers adjoining to the back wall of the pit.

h Cavities from whence the air heated by the flue passes into the stove from the chamber, by openings near the top.

Fig. 3. Section of the Cucumber stove.

a Back and front flues.

b Cavities over the flues.

c Borders for the Cucumber plants.

d Wires to which the Cucumber plants are trained.

e Pillars to support the ridge of the roof.

f Vacant space in the stove.

g Cavities for the heated air.

Fig. 4. Section of the front flue and cavity under the Melon pit.

a The flue.

b The cavity.

c Hole for the escape of the heated air from the chamber.

d Pipe for supply of water to the top of the flue.

Fig. 5. Plan for laying the horizontal covering of the cavity under the Melon pit.

a Bricks supporting the covering.

b The covering.

c The cavity.

Fig. 6 and 7. Plans for an improvement in the position of the front flue in the Melon stove.

a Front wall.

b Open arches in the wall.

c Flue.

d Cavity round the flue, the top being formed of stone.

e Internal cavity.

f Pipe for supply of water to the top of the flue.

Fig. 8. Front of the flues, cavities, and borders.

a The flue.

b The cavity.

c Holes through which water is poured into the cavity.

d The border.

e Plug to stop the holes in the cavity.

LVIII. *Notices respecting the* Strawberries *cultivated for the Market in Scotland. By* Mr. James Smith, *Corresponding Member of the Horticultural Society of London, Gardener to the Earl of* Hopetoun, *at Hopetoun House, near Edinburgh.*

Read August 15, 1826.

The cultivation of Strawberries in the neighbourhood of large towns in Scotland, is found to be a very lucrative employment, and is therefore carried on to a considerable extent. By its means poor and industrious men have risen to comparative opulence, and, in some instances, the farmer has been induced to add it to the ordinary branches of agriculture. It is stated by Mr. Neill in his Treatise on the Gardens and Orchards of Scotland,* and I believe from sufficient data, that the quantity of land under Strawberries near Edinburgh does not exceed a hundred acres.† From what I can learn, this quantity has not been much increased. Mr. Neill has given, in the work referred to, a brief account of the Strawberry Gardens in the vicinity of Edinburgh in the year 1812. I am informed that at Glasgow, Strawberries are estimated to occupy only one tenth of the Market Gardens, which places the consumption of that town considerably behind that of Edinburgh, in which, from the market-duty paid, the annual supply appears to be from 30,000 to 50,000 Scotch

* Neill on Scottish Gardens and Orchards, in Sir John Sinclair's General Report on the Agricultural State, &c. of Scotland, vol. ii. page 90.

† The Scotch acre is to the English acre, nearly in the proportion of four to five; the former containing 6084 square yards, the latter, 4840.

pints.* If, however, we take into account the quantities which are consumed in the gardens, a favourite resort of parties of the citizens in the Strawberry season, it is probable that Mr. NEILL's statement, in the work already quoted, of from 60,000 to 80,000 Scotch pints on an average, according to the season, may not be exaggerated.

The Strawberry gardens in the immediate vicinity of Edinburgh, are neither very numerous nor extensive, principally on account of the high rent of land; but also, because most of the fields, and particularly the market gardens, have become so saturated with manure, as to cause them to be more productive of leaves than of fruit. The greater number are about Dalkeith, Laswade, Roslin, Ratho, and Corstorphine, all of which places are within eight miles of Edinburgh. There are, however, some considerable Strawberry gardens beyond this circle, even as far as Haddington, a distance of eighteen miles. Excepting the large sorts, they are pulled without the calyx, and are put into small baskets, each containing nominally one Scotch pint. These baskets are packed above one another in square hampers, and are conveyed to the market on a light carriage, or frame work, hung on springs.

The labour of cultivating Strawberries, which is usually light, becomes incessant in the fruit season, on which account the ground employed for this purpose round Edinburgh, by one grower, is seldom more than six Scotch acres, and in general does not exceed three or four. As, however, the cultivation of Gooseberries, Currants, &c. is commonly combined with that of Strawberries, market gardens are usually

* The Scotch pint contains 103 solid inches, and is nearly equal to three Imperial pints.

more extensive. Of these the rent varies from £5. to £15. per acre, those being cheapest which are farthest from the city. The average price of labour per acre, including carriage, &c. is less than £5, and the rate of profit, taking a combined average of seasons and situations, is from £35. to £40. per acre. Occasionally a much greater sum is obtained. In one instance, within my own knowledge, a gross amount of £120. was made from a single acre, planted in equal portions with the Old Scarlet and Roseberry varieties. Greater sums than this have been talked of, and I have heard that 3400 Scotch pints have been gathered from one acre and a half of the Roseberry kind, but I have not been able to authenticate any of these statements. The usual rate of production is much below this, and in dry seasons very far so indeed.

The following are the varieties* usually brought to the Edinburgh market.

The Old Scarlet was long the only Strawberry cultivated in this part of the country, and is still a great favourite.

The Roseberry of late years disputed the superiority with the preceding variety, but is now in less repute, on account of its liability to become injured, and to lose its flavour by carriage.

The Surinam is grown in considerable quantities under the name of Hautbois, among the Vendors; and of Chili, among the Gardeners. It is likewise mixed with the three following kinds, the relative proportions of which I have been unable to determine.

* The names of the varieties of Strawberries, used in this communication, are those established by the Horticultural Society of London, in a Paper printed in their Transactions, (Vol. v. page 145), under their authority.

The Glazed Pine.

The Chinese.

The Round White Carolina.

The Hudson's Bay is pretty common under the name of the *Mulberry,* and is used as a kitchen fruit.

Keen's *Seedling,* and Keen's *Imperial,* appeared in small quantities last season. The name of the former has already been corrupted by the growers into *King's Seedling.*

The real Hautbois, of which there are some varieties in our gardens, are never offered for sale, as from their appearance they do not attract in the market. The Alpine Strawberries are also confined to private gardens.

I have not been able to ascertain correctly, the names of the kinds which are sold in the Glasgow market; but I believe they are generally the same as those cultivated for sale round Edinburgh, with the addition of the *Bostock,* which is superseding all the other Strawberries at Glasgow. An acre of this variety in 1825, produced 1600 Scotch pints, but in the present still dryer season, only 1333.

The culture of Strawberries for the market, does not essentially differ from that which is practised in private gardens; but as it has somewhat more of an agricultural character, it may not be uninteresting to notice a few of its details.

Formerly Strawberries used to be cultivated, especially in the environs of Edinburgh, on steep sloping banks. Such situations afford very early fruit, which brings a high price; but as the crop is always small, and in dry seasons less, they are only in a few instances used at present. Those places are preferred which are open, but not exposed, generally flat, or sometimes the lower half of a gentle declivity. As to

soils, there is no one which suits every season alike. In rainy summers, a light soil is most productive, and in dry years a retentive one. A strong fresh deep loam is best adapted to the general run of our seasons. Strawberries do not thrive on thin clayey soils, and they die on peat moss.

The ground, in preparation for planting, is digged over, or ploughed when extensive. By some it is trenched; but this on a large scale is costly, and sometimes not very expedient, as by the operation the rich surface soil is buried. The most promising field of young Strawberries which I have this year had an opportunity of observing, had been an old pasture, the turf of which was merely turned over with the plough, and the surface smoothed with a rake. In general, deep ploughing is practised, and the ground is well harrowed. Manure is but sparingly applied, as it is supposed to favour the growth of leaves rather than of fruit. Dung is given to light, and lime occasionally to heavy soils.

The plants are always set in rows, which in the luxuriant varieties, are two feet distant from each other, and in the others, from eighteen to twenty-two inches. It is thought desirable that the leaves should cover the greater part of the intermediate space, in order to protect the roots from the parching influence of the sun. Of late, the rows of the Scarlet and Roseberry have been disposed at the distance of two feet, and a foot and a half, alternately; the wider interval allowing the gatherers of the ripe fruit space to tread, without crushing that which remains, and at the same time affording room for a secondary crop of dwarf Peas, Carrots, or Onions, which are commonly sown in the first year, in order that it may not be devoid of every sort of return. In the rows, the

plants are placed at the distance of from five to ten inches from each other. It frequently happens that when fully grown, the plants form a continuous line, and this is supposed to preserve the fruit from being soiled by rain. The clusters, or stools of three plants together, formerly common, are now universally abandoned. They were found, particularly in the Roseberry, to choke the plants, and to bring on premature old age. The Market gardeners always prefer spring to autumn planting.

The runners, are seldom or never removed in market gardens before the fruit is gathered, and frequently not for a considerable time afterwards. The growers, indeed, admit that it should be done as soon as the fruit season is past; but the gooseberry and currant crops immediately succeeding occupy their attention; then sometimes there are a few acres of corn which must be reaped, so that the Strawberries are often neglected till the middle of September, or the beginning of October. At this last period the plants are further dressed for the winter. The runners and recumbent lateral leaves are cut off with a sickle, whilst those which are erect are suffered to remain, and are not shorn down, as has been most erroneously stated. The spray so cut off is removed, and the intervals worked with the hoe and raked, care being taken not to injure the roots in the operation. The practice of digging between the rows, recommended by Mr. NICOL* and others, is almost entirely given up. In dry seasons, this was uniformly experienced to be prejudicial on account of the looseness of the soil which it produced. Further, according to Mr. NICOL's directions, the lines were formerly rutted on both sides, that is, the spade was pushed down perpendi-

* Forcing, Fruit, and Kitchen Gardener, 4th Edit. page 267.

cularly its whole length, and consequently many roots, essential to the future support of the fruit, were cut off; and it was nearly ripe in the following summer, before the mangled roots had recovered their vigour, so that the production of leaves was all they could do. The manure, too, which was applied in winter, came too late, for the buds and embryo flowers had been previously formed. The idea of manuring growing Strawberries is entirely discarded; for though manure may be applied in a liquid form, yet it is deemed better when the ground is impoverished, to renew them altogether.

Strawberries do not retain their vigour for many seasons. Scarcely more than two crops can be obtained from the Roseberry; the Bostock and Hudson's Bay, afford three; the Surinam, four or five; and the Old Scarlet, five or six; but it is frequently advisable to renew the latter kinds, after a shorter period. They are never immediately replanted on the same piece of ground. Two or three intermediate crops of potatoes, turnips, or other esculent vegetables are generally taken, and along with them the necessary manure is applied. The old Strawberry plants are carefully pared off and removed, not ploughed down, and but seldom trenched in; because, like most other plants, their decaying matter is considered not to act as good manure for individuals of the same species, or family. During the intermediate cropping, the creeping grasses and other root weeds are carefully extirpated. It is to be remarked, that every Market-gardener has a portion of his grounds under these preparatory crops, which accounts for the fact, that the number of acres actually employed in cultivating the Strawberry, is greater than what might be calculated from their produce.

Much of success in raising Strawberries, depends upon the

nature of the season. That is the most favourable, in which there are, now and then, gentle rains from the time the blossom expands, till the fruit begins to form. It too frequently happens that this is not the case; for during the month of May, and the greater part of June, dry east winds prevail along the whole of the East coast of Scotland. On such occasions the Strawberries are usually left to their fate, as the labour of watering is too great to be performed to much good purpose. Irrigation, by means of canals, has received little attention; and, indeed, most of the grounds are so situated, as to render that operation impracticable. It is probable, however, that it may come partially into use. During the season of the present year, an eminent grower on the banks of the Esk was very successful in this way. Another individual, in the neighbourhood of Edinburgh, flooded his Strawberry plants from the common drains of the city, and obtained, in consequence, the finest fruit that were brought to the market.

The above notices respecting the cultivation of Strawberries are communicated to the Horticultural Society, not as what may be accounted best, but as what is actually done. Yet it is probable, considering the activity of the growers, and the competition which they have to maintain, that a cheaper, and at the same time an equally effective mode of cultivation, could scarcely be devised.

LIX. *Upon the* Cultivation of Fuchsias. *In a Letter to the Secretary. By Mr.* James Smith, *Gardener to* William Pinchback, *Esq. of Camberwell, Surrey. Communicated by* John Wrench, *Esq. F. H. S.*

Read September 19, 1826.

Sir,

It has been suggested to me, that an account of my plan of growing *Fuchsias*, might be acceptable to the Horticultural Society, I therefore have requested Mr. Wrench to transmit a description of it to you.

The method I have adopted in the two last seasons, in growing the Fuchsia gracilis, F. tenella, F. arborescens, and F. excorticata, is as follows:—about the end of February, or the beginning of March, I strike, in the usual manner, from the youngest shoots, as many plants of the different species as I think I may want. After they are fit to pot off, I put them into small sixties, thence into large sixties. While they are in these last sized pots, I keep them in a gentle moist heat, to make them acquire some strength; then I remove them into the green-house, shifting them every three or four weeks, as the pots fill with roots, till the plants are established in twenty-four sized pots, in which they finally remain to flower.

Nothing can surpass the beauty and regularity of the plants grown in this way. I have now some of the Fuchsia gracilis, from three and a half to five feet high; also the Fuchsia tenella, two feet and a half high, with single straight stems, the branches hanging over, and nearly covering the

pots; and, as the branches naturally shorten towards the top, forming a perfect pyramid, every flower is shewn to the best advantage, whereas in the general way of growing Fuchsias from an old stem, some of the shoots are much stronger than others, or do not grow with sufficient vigour to flower, and even if they do flower, it is partially, and without the least appearance of neatness and regularity, nor are the flowers near so large as on the plants grown by the method I have detailed.

The soil I have found the Fuchsias to succeed in best, is a mixture of equal parts of loam and bog-earth, with an addition of about one fourth sand.

I find the Fuchsia gracilis succeeds better when planted out in a border, than the old F. coccinea, and I believe it will stand our winters equally well or better, being of a more woody nature; it continues in full blossom quite into November. I have one now growing in a border which is three feet high, and bushy in proportion, that was rooted late this spring. I should observe, the situation in which it is growing is rather shaded, and I have found that the Fuchsias, generally, do not like full exposure to the heat of the sun, particularly during the time of flowering. Those who wish to grow this beautiful genus in perfection, should guard against the Thrips, Aphis, and Red Spider, for no plants are more liable to be injured by the attacks of these insects.

I am, Sir,
your obedient humble servant,
James Smith.

Camberwell Green,
September 1, 1826.

LX. *Notice of certain* Vineries *at various places in Scotland,* with Arched Hanging Trellises. *By Mr.* William Smith, *Under Gardener in the Arboretum Department of the Garden of the Horticultural Society, at Chiswick.*

Read September 19, 1826.

The practice of training Vines in hot-houses upon arched hanging trellises, seems to have originated in a desire to get rid of the inconvenience which is felt in Vineries, where the under surface of the roof is entirely covered, the close shade thereby produced preventing any thing from growing under it, and rendering a trellis upon the back wall almost useless.

That this is an evil which is generally felt, especially in places where the accommodation is not sufficient for the things required to be produced, is evident, from the very general practice of covering the roofs of houses partially, or of training under the rafter only, or upon three or more wires, fixed under it for that purpose.* In these cases, the evil in question is in a great measure removed; but still it is found that the space for training is so much diminished, that the practice is not altogether warrantable, unless the houses are employed for some other express purpose; and then the sacrifice is compensated by the other articles which are cultivated at the same time.

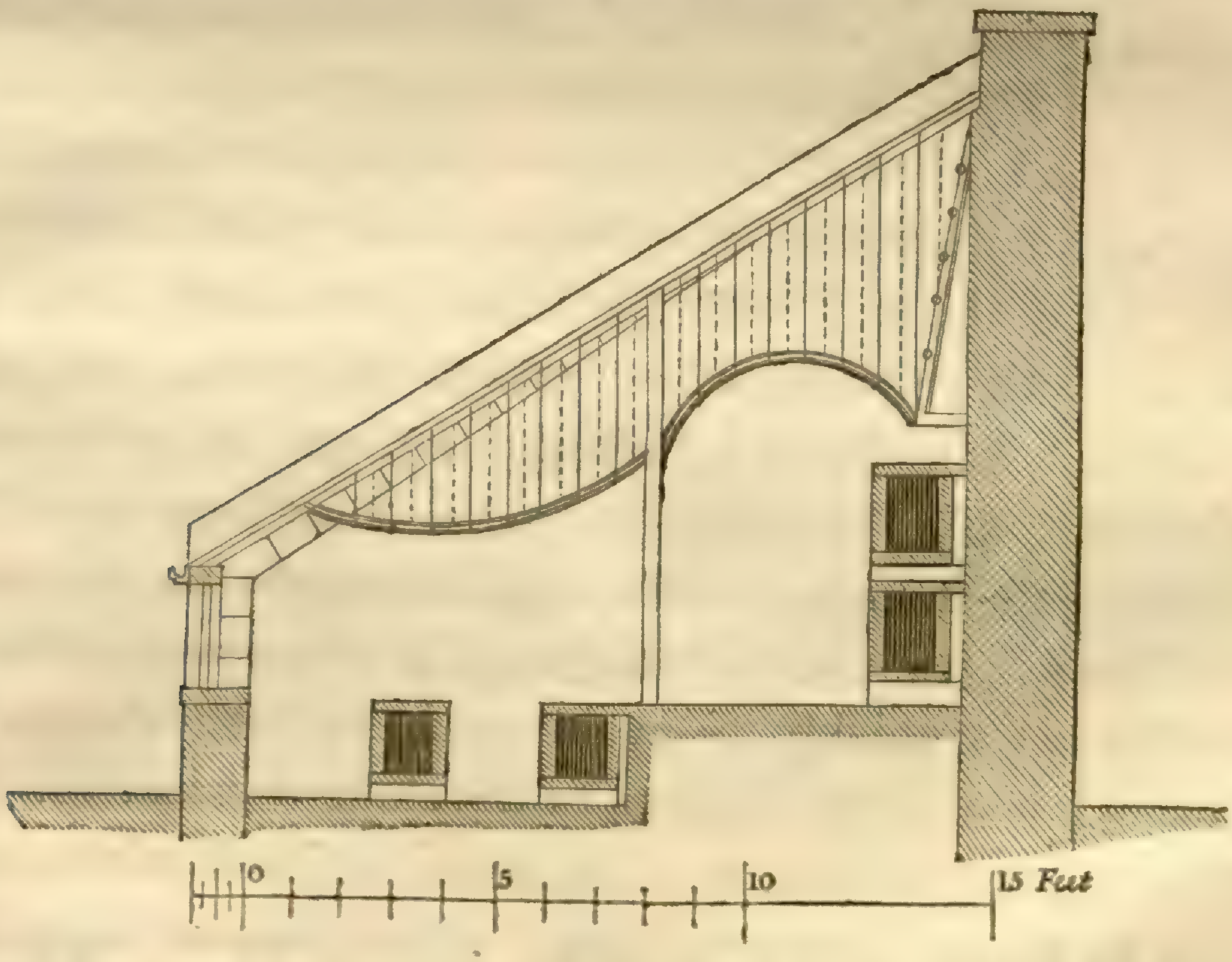
The hanging trellis has therefore this superiority, that while it admits light to the interior of the house, it encreases the space for training considerably. The first use of a trellis, of this description, of which I have any account, appears to have been at Balcarras, the seat of the Honourable Robert Lindsay. A notice of it was communicated by his Gardener,

* When an open space is left under the glass between the rafters, much benefit is derived to the fruit growing under the rafters, by the direct admission of the sun's rays; this advantage equally results where hanging trellises are used.

Mr. Archibald Reid, to the Caledonian Horticultural Society, in the year 1817, but was not published* in their Transactions till 1825.

The hanging trellis was subsequently used at Salton Hall, in East Lothian, the seat of Andrew Fletcher, Esq. in a new house, erected there according to the designs and plans of Mr. John Hay, of Edinburgh. The trellis there, as I have been informed, consisted of vertical spars of wood, fixed to both sides of the rafter above, and below, to a frame of the same thickness as the rafter, and formed like part of an arch, passing from the front to the back wall. The narrowest part of the trellis was towards the front, and it increased in depth towards the back.

A trellis upon the same principle, was erected in the spring of 1822, by my father at Hopetoun House, where he is Gardener, and where I then lived. It was adapted to a house, (a section of which is annexed) fifty feet long, and fifteen wide.



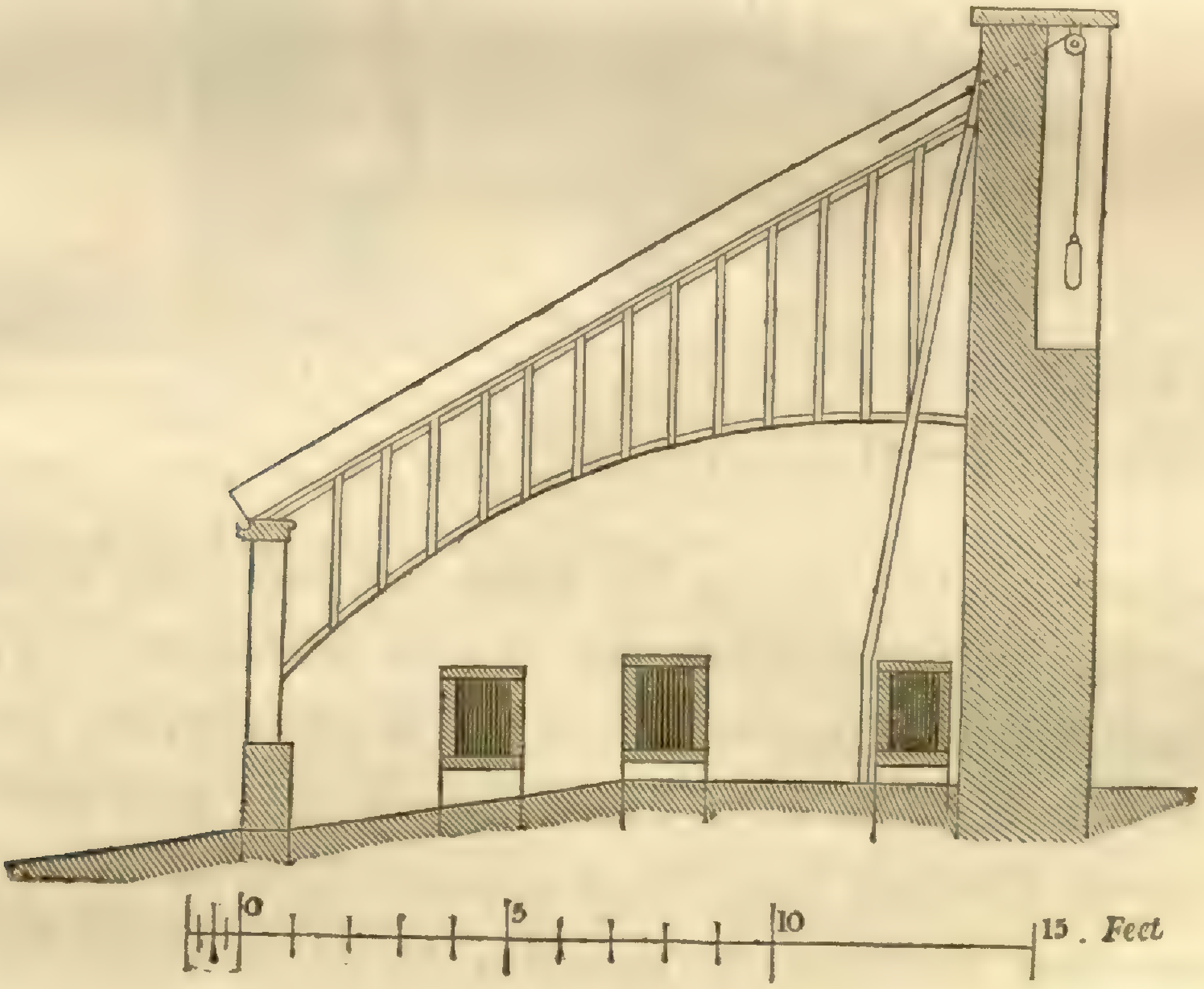
* See Memoirs of the Caledonian Horticultural Society, vol. iii. page 465.

The back wall, up to the glass, is thirteen feet from the floor, and the front glass two feet nine inches. Under each rafter is suspended a frame work of wood, of the same thickness as the rafter above. It is composed lengthways, of two separate pieces, supported where they join by a post which goes from the floor to the roof; that between the post and the back wall is an arch of nearly a half circle; it is fixed at the other end to the wooden trellis, next the wall; the other piece is an arc of a circle turned the reverse way, joining the rafter of the house at the front, about two feet from its end. Between the frame-work and rafter, are stretched strong wires in a vertical position; they are fixed to both sides, and alternate with one another on the opposite sides; the breadth of the trellis at the post is about three feet, and six feet six inches at the back wall. Wires were chosen for the trellis in preference to wooden spars, as being much lighter in appearance; they are also less expensive, and more convenient, and when properly painted, no ill effects need be apprehended from rust. Upon the back wall, is a trellis extending as far down as the bottom of the hanging trellis, and within a foot of the top of the return flue, two turns of which occupy the lower part of the wall. There is also a wire trellis under the glass as in other houses, which existed before the alteration, and which was suffered to remain after the hanging trellis was added. The Vines are trained a short way upon this, then along the hanging trellis, and ultimately on the trellis at the back. In this training, care is taken not to lay the branches in too thickly, to avoid confusion, and also to give sufficient room to the clusters to develope themselves.

The hanging trellises have also been adopted at two other places, in houses erected in 1823. The plans of these have been obligingly transmitted to Mr. Sabine, for my inspection,

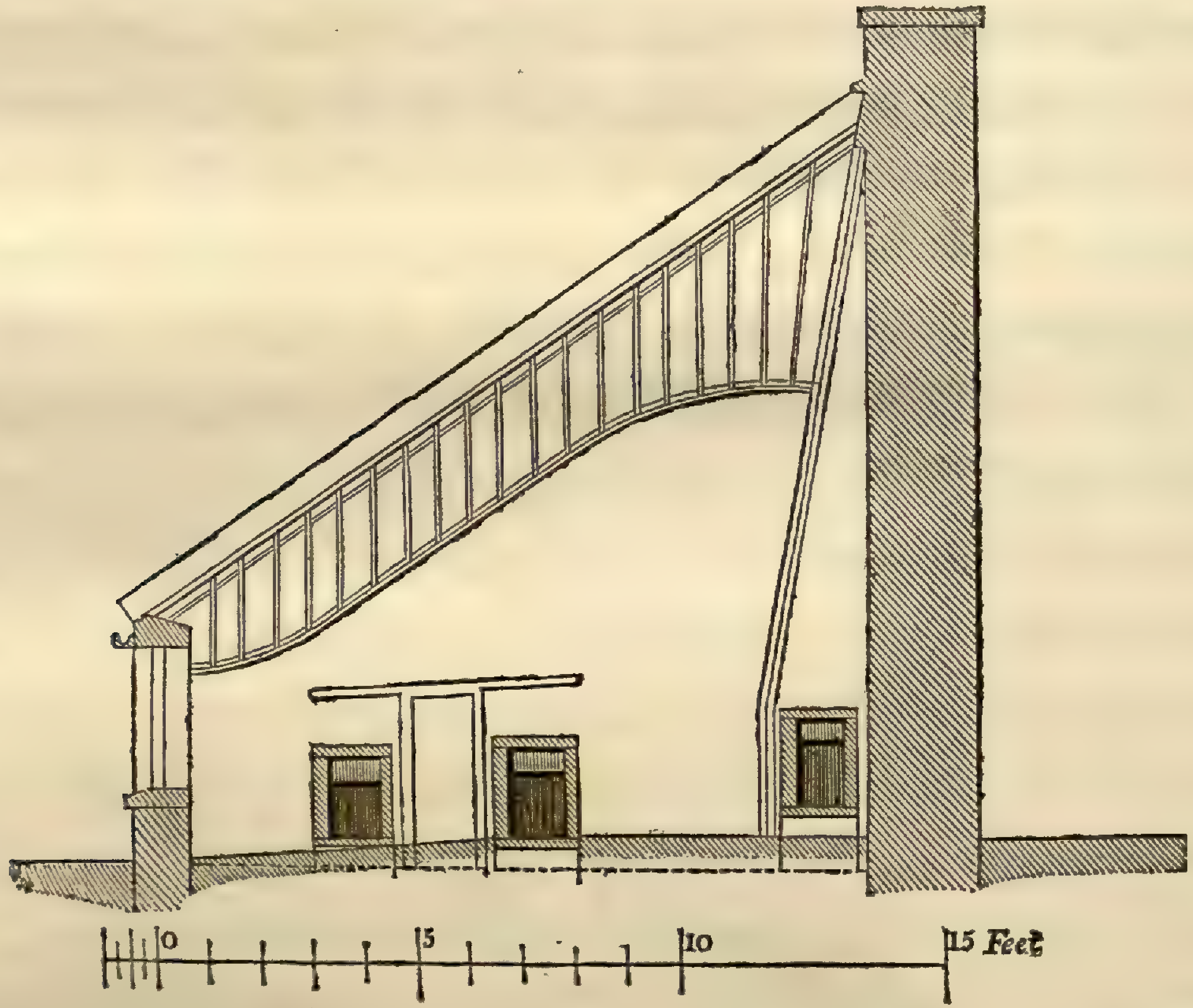
by the gentlemen in whose gardens they have been executed, viz. at Riccarton, the seat of James Gibson Craig, Esq. and at Redbraes, belonging to Mr. Walter Dickson, both near Edinburgh. Mr. Hay has also recently built a Vinery at Castle Semple, the seat of Major James Harvey, in Renfrewshire, to which the hanging trellis has been applied, and he has been so good as to furnish me with a plan of it. These three are nearly all of the same construction as that first erected by Mr. Hay, at Salton, with the exception of some slight improvements. An account of another description of hanging trellis, will be found in the Transactions of the Horticultural Society of London,* by Mr. Beattie, of Scone, in Perthshire. This differs considerably in construction from any of the others, but still the principle is the same.

In the Vinery at Riccarton, of which the following sketch exhibits the section,



* See Vol. v. p. 495.

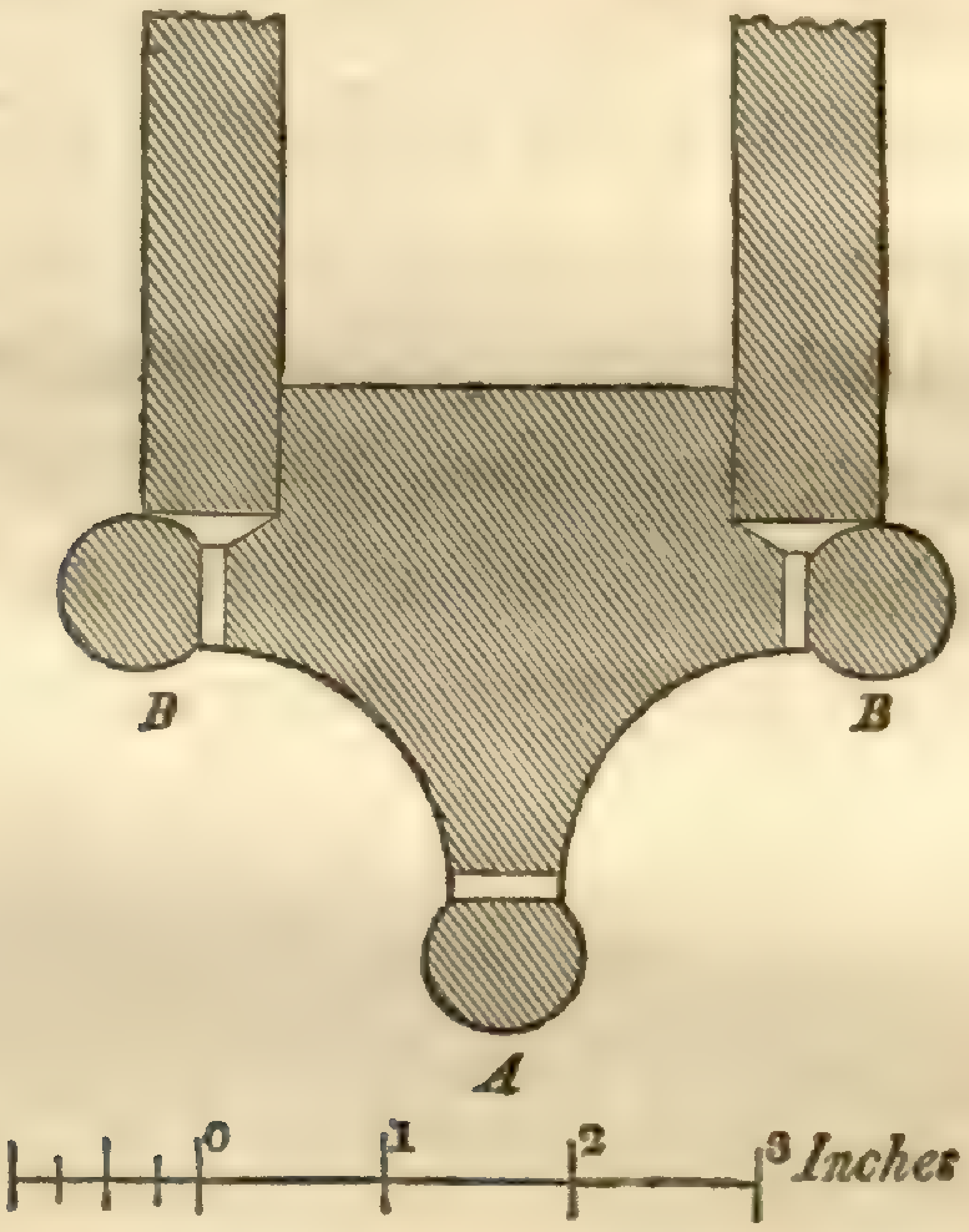
the bottom of the trellis is a single arch passing from the front to the back wall; the trellis is made of wooden spars, five eighths of an inch square; they are fixed on both sides, and are ten inches apart; the depth of the trellis is two feet at the narrowest part, and six feet six inches at the wall. There is also a trellis on the back wall for Vines or Figs, and no Vines are trained under the glass, but upon the trellis only. The Vineries at Redbraes and Castle Semple are nearly of the same construction.



The above sketch shews in what respect the Vinery at Castle Semple differs from the one at Riccarton. There is also the addition of an horizontal trellis placed over the front flues, which consists of a frame nearly two feet wide, with spars about five feet long fixed across it, placed thirty inches separate from each other, in order to allow room to stand upon the flues when dressing the Vines on the hanging trellis.

Two branches of Vines are trained horizontally upon this frame, which thus affords an additional crop besides that growing on the hanging trellis. There is likewise a trellis on the back wall for Vines or Figs, and nothing is trained under the roof, or upon the front glass.

In the hanging trellis at Castle Semple, there is an improvement in the construction of its lower member, of which the annexed is a section.



It is bevelled off on the under side, and a round rod, A, passes along the ridge, from which it is separated at intervals by small pieces of wood, the spaces between which, allow opportunity for tying the branches to the rod, upon which it is trained. The clusters of Grapes produced on this branch, are tied up or supported by threads or matting to two similar rods, BB, which are fixed to the sides of the member, in the same manner as that below.

It is not my intention to give an opinion of the superiority that any one of these plans may possess; it will be sufficient to remark, that they may be all used with advantage, and that

one may be applied to one house in preference to another. The one at Hopetoun House might be best adapted for a wide low house, and that at Scone would be best suited for a very narrow house, without upright glass, while Mr. Hay's construction would be more in place in a lofty house with high upright glass in front.

The design of the trellis used at Hopetoun House might be applied with good effect in a double house, that is, with the glass sloping two ways. The semi-circular arch might be placed over a centre walk, and the wings of the trellis extended on each side.

It is probable that these plans may be capable of still further improvement, and that the principle might be extended to Peach-houses; in which case the trellis would require to be somewhat differently constructed.

LXI. *Observations on the Qualities of* newly raised Fruits, *exemplified in* Plums. *In a Letter to the Secretary.* By Thomas Andrew Knight, *Esq. F. R. S. &c. &c. President.*

Read September 19, 1826.

My Dear Sir,

Every person, who has been long and extensively engaged in raising new varieties of fruits from the seeds of highly improved kinds, must have observed the prevalent defect of the seedling fruits, to be the want of a sufficient quantity of saccharine matter. The pulp is often of very good quality, and the juice is frequently abundant, but it is generally found to be, in a large majority of cases, insipid and watery. But when I have obtained new varieties of the same species, by introducing the Pollen of a highly improved variety into the blossoms of one of a much less cultivated habit, I have generally obtained fruit which contained much saccharine matter, usually, though not always, combined with excess of acid. This has occurred so extensively in my experience, that I have latterly been led to doubt, whether acid species of fruits do not, when cultivated through successive seedling generations, first gradually become saccharine, and afterwards insipid. Under these impressions I have lately made some efforts to raise plants from seeds of wild and acid varieties of the Plum, employing the pollen of highly improved varieties of that species of Fruit. I have sent you a few specimens (some of them rather as objects of curiosity, in their

present state, than of use) of a few of those varieties of the Plum.*

Nos. 1 and 2 were obtained from seeds of the Damson, and pollen of the Imperatrice Plum. I have yet seen two only of this family, but both appear to me to be improved varieties of the Damson; and I believe, that, when they shall have hung to shrivel upon the trees, they will not be found wholly undeserving a place in the dessert, late in the season; and, as far as present observations allow me to speak, they appear as hardy as their female parent.

Nos. 3 and 4 are the offspring of a graft which I selected from a hedge, far from any habitation, and obviously a variety of our native Sloe, or Bullace, Prunus spinosa and P. insititia (I do not consider those to constitute distinct species), and its blossoms were fertilized by the pollen of Coe's Golden Drop Plum. The fruit is much larger than I expected to see it, and it presents a more cultivated character than I had anticipated; the trees grow with very great luxuriance, and their present appearance indicates very productive habits. The fruit of two varieties of this family, which ripened rather early, contained a good deal of sugar. One of these, which I have sent, will not be ripe till November; but I send it, because it presents a greater extent of deviation from the character of its female parent, than any others of a numerous family which my garden contains.

No. 5 is the offspring of a very hardy and productive, but wild and acid, variety of the Plum, which abounds in the

* A Drawing was made by Mrs. Withers of these Plums, when in a fresh state, from which the annexed figure has been taken. On tasting the Plums, it was found that No. 1, 2, and 6 had much merit, especially the two last.

Mr. Knight's Seedling Plums.

Engraved by Wm. Clark.

hedges of cottage-gardens in the vicinity, and the pollen of Coe's Golden Drop Plum. It appears to possess very nearly the same qualities as the Winesour Plum, which it greatly exceeds in size, for culinary purposes, and for preserving; and it differs from that variety, which in most situations bears ill, in being the most regularly productive with which I am acquainted. The samples sent were the last which remained upon the tree, and are a good deal less than the average size of the variety.

No. 6 is, I think, a very fine Plum, in its perfect state of maturity, when it is allowed to shrivel upon the tree. It is larger than the Imperatrice, its female parent, when grown in the same soil and climate, and I have found it to contain more juice than that variety, with an equal quantity, at least, of saccharine matter. The tree produced its first blossoms last year. Its growth is very luxuriant, and it will produce blossoms abundantly next season; but I fear that they will not set well in my climate. The sample sent was grown upon a wall. I have found the offspring of the Imperatrice Plum, unlike those of the Green Gage and Coe's Golden Drop, to contain generally much saccharine matter, with a good deal of astringency, whence, I conclude, that it does not derive its origin from highly cultivated parents; and its foliage and habit appear to justify this conclusion.

I remain, My Dear Sir,

Sincerely yours,

Thomas Andrew Knight.

Downton, September 16, 1826.

LXII. *On the Application of* Tobacco Water in the destruction of Insects. *In a Letter to the Secretary. By Mr.* Joseph Harrison.

Read August 15, 1826.

Sir,

It is with pleasure I transmit to you the following statement of an easy and successful method of destroying the Green Fly, which so generally and severely attacks Peach and Nectarine Trees, also the Black Insect, which attacks the young shoots of Cherry Trees, and the different kinds of Caterpillars infesting Apple, Pear, Plum, and Apricot Trees, and Gooseberry Bushes.

The means which are generally applied for the destruction of the insects above named, I have uniformly found do not effect the desired purpose, without the trees suffering in consequence of the damage or destruction of the shoots, foliage, young fruit, or blossom.

Having had the opportunity of trying various experiments upon the fruit trees under the care of my father at Wortley Hall, in order to discover what would effectually destroy the insects without injuring the trees, I find that the Tobacco water hereafter named, and applied as directed, answers the desired purpose, for whilst it entirely destroys the insects, the trees are in no way injured by the infusion, however

strong it may be, but, on the contrary, it seems to promote their general health. Trees entirely free from insects have been washed with it, and have given satisfactory proof of this fact.

The Tobacco liquor I have used, is procured from the Tobacco manufacturers. In the process of preparing Tobacco for use, the dried herb is steeped for a certain period, and the water which it has absorbed, is afterwards expressed from it, into the water in which it had been steeped. This liquor is to be purchased at eight-pence or ten-pence per gallon from the manufacturers, and should be obtained as pure as possible without adulteration.

One gallon of the liquor is stronger than any that could be made from steeping several pounds of prepared Tobacco, in the same quantity of water. The mixture of the Tobacco liquor with water is in the following proportions, and should be applied to the trees by means of a garden engine, or syringe, taking care, in its application, that it is given so forcibly that the under side of the foliage is well sprinkled.

For the destruction of the Green Fly, I mix one gallon of Tobacco liquor to five gallons of pure water; this quantity is sufficient to wash three trees, twelve feet high, and each extending fifteen feet in breadth. For destroying the Black Insect, one gallon of liquor to three of water. For destroying the Caterpillars on Pear, Apple, Plum, and Apricot trees, and on Gooseberry bushes, one gallon of liquor to four of water. The above proportions have been frequently tried, and have never failed of success.

If the means be employed agreeably to the foregoing statement, I am confident they will be found fully to answer.

I am, Sir,
Your very obedient servant,
JOSEPH HARRISON.

Wortley Hall,
August 1, 1826.

LXIII. *On the Cultivation of* Nelumbiums. *By* Joseph Clare, *Esq.*

Read February 7, 1826.

The Nelumbium Speciosum has been occasionally cultivated in England, but the plants have been soon lost, having seldom been brought to flower, and then but feebly. The yellow flowering Nelumbium from America has, I believe, never been successfully cultivated in England. In its native country, the Nelumbium speciosum grows on the borders of rivers and lakes, or in such ponds as are of a size sufficient to allow the agitation of the winds on their surface, thus preventing their stagnation. In England, Nelumbiums have always been planted in stagnant water, for such our Aquariums must be considered. These Aquariums are consequently overrun with slime and confervæ, and the plants in them are soon choked up and destroyed. Placed in this manner in small tubs or cisterns, these aquatics would not live even in the open air of their native climates.

A few years ago I made some experiments upon the method of growing water plants in the north of Italy, which is nearly the same climate as the north of China, where, Dr. Abel*

* See Abel's Narrative of a Journey in China, page 122. At the place referred to, Dr. Abel gives the following account of Chinese Nelumbiums. "The Nelumbium is used by the Chinese to decorate lakes, and other ornamental water, and to give a charm and productiveness to marshes, otherwise unsightly and barren. Near Yuen-Ming-Yuen, and under the walls of Pekin, I saw it covering with pink and yellow blossoms large tracts of land, and could sympathise with the enthusiasm of the Chinese bards, who have sung of the delight of moon-

informs us, the Nelumbiums grow far better than in the south. All that the plants require is fresh water, and a long and warm summer; they are not affected by the severest frost of winter. The ditches under the walls of Pekin, which abound in Nelumbiums, are frozen sufficiently strong to bear carts upon the ice. In the summer of 1822, the thermometer of Fahrenheit was for some weeks 93° in the shade in the north of Italy, and in the following winter it was at 25° below the freezing point for above a month.

In the spring of 1822 I planted some seeds of Nelumbiums in the open air in Italy in a large tub, half filled with earth, covered with tiles, and then water, which was changed every second day. The seeds came up well, but the plants were soon covered with confervæ, and rotted away. The same happened to some other seeds which had been sown in a large pot, and plunged in a stone tank forty feet square, and of sufficient depth. I then put some seeds, both of N. speciosum, and N. luteum into a large pot, and plunged it in a small stone basin, in which there was a fountain always playing, and the water constantly agitated by having to supply water to a large garden. In this the plants were raised, and they flourished very much, throwing up leaves two feet wide,

light excursions on rivers covered with the flowering *Lien-wha.* Its seeds, in size and form like a small acorn without its cup, are eaten green or dried as nuts, and are often preserved as sweetmeats; they have a nutlike flavour. Its roots, sometimes as thick as the arm, of a pale green without, and whitish within, in a raw state are eaten as fruit, being juicy and of a sweetish and refreshing flavour, and when boiled, are served as vegetables. Both seeds and roots were frequently sent with the dessert to the Ambassador's table: the former were relished by us, but the latter were too fibrous to be eaten with pleasure. The leaves are said to possess a strengthening quality, the seed vessel to cure the cholic, to facilitate parturition, and to counteract the effects of poison."

with abundance of flowers, and they ripened a great quantity of seeds. These plants, though left every winter in the open air, have since continued to bear abundantly. Professor Bergamaschi, of the University of Pavia, had for several years in the Botanic garden of that city, a plant of the American Nelumbium luteum, which, though it did just live from year to year, never flowered, till the tub becoming leaky, he was forced to turn a pipe of running water over it; the plant then sent up flowers, and it ripened many seeds in that same year.

There is a great variety of Nelumbiums in China, and if their cultivation should succeed in England, probably many of these will be imported, since the seeds can be easily transported, and they will keep good very many years. The late Mr. Lee told me, that they had vegetated with him after having been kept forty years. In England they must have the heat of glass; but I think it very possible that, at some future time, hybrids may be obtained from them and our own beautiful Nymphæa alba or Nymphæa odorata, Nymphæa cærulea, or others which seed freely in this climate, the two first in the open air.

That frugal and industrious people the Chinese, have always diligently cultivated Nelumbiums. They spread over all their lakes and rivers; and the swamps, which will bear nothing else, are covered with them. The leaves, which are three feet broad, are gathered for fuel, the nuts are more delicate than the Filbert, and the roots, which are long, and as thick as a man's arm, are eaten with sugar; they have the taste of an almond. It having been proved that they will flourish in the open air in the south of Europe, at some future period perhaps the seeds may be as common in our

desserts as the Spanish chestnuts on our stalls.* Italy, which has thousands of useless acres on the borders of the many lakes in the north; the large tracts of Mammora in Tuscany, and the still more extensive Pontine marshes; all these, which now produces nothing (I mean the parts actually water or swamp) may be covered by Nelumbiums. There will be this great advantage attending their culture in Italy, that the produce may be gathered late in the autumn, when the season of the Malaria is over.†

I ought to have mentioned above, that the Nymphæa cærulea flourished exceedingly under the same treatment with the Nelumbiums, and bore flowers of double the size of those it bears in England, and of exquisite fragrance. This plant, like the Nelumbiums, requires a warm summer, but is perfectly hardy in regard to frosts. A plant flowered vigorously in the following summer, which had been left in a frame during the winter, and frozen into a cake like iron.

* One of the greatest gifts to the south of Europe will be perhaps the Camellia Oleifera (lately imported into Europe by the Horticultural Society), as its oil is said to be equal to the Olive, and it will grow in the same climate, requires a less fertile soil, is of much greater growth, and more abundant produce.

† Pallas in his travels mentions having seen a Nelumbium growing in great abundance near Astracan and at the mouth of the Volga. This is probably either a new species or a distinct variety, as he says that a very fragrant water is obtained from its flowers. The Chinese and American Nelumbiums have a faint but very pleasant scent, resembling new hay, or the Tonquin bean. See Pallas's Travels in the Southern Provinces of the Russian Empire. 4to. London, 1802, Vol. i. page 260. (The particular plant here alluded to is the Nelumbium Caspicum. *Sec.*)

LXIV. *Notices of Communications to the* Horticultural Society, *between January* 1, 1823, *and January* 1, 1824, *of which separate accounts have not been published in the Transactions. Extracted from the Minute Books and Papers of the Society.*

Charles Calvert, Esq. exhibited on the 4th of February, *forced Roseberry Strawberries in Pots,* the fruit of which was very fine. Plants with more abundant produce than those shewn, had been sent to the house of the Society, in the middle of January. Mr. George Meredew, Mr. Calvert's gardener, gave the following account of his plan of management which unquestionably had been particularly successful. Runners were placed two in a pot early in July, and the pots were left in a shaded situation till the end of the month, they were then plunged in an open quarter of the garden till the end of September, having been regularly watered during the whole time. At this period they were repotted, one plant only being put into a pot, and transferred with as much earth as possible attached to the roots. The pots were then set under a frame, with a little bottom heat, being supplied daily and regularly with air, and kept thus till the end of November, when they were moved into the Pine stove. The fruit began to ripen early in January.

John Williams, Esq. of Pitmaston, in a Letter to the Secretary, dated the 28th February, communicated the following particulars of his *treatment of the Golden Pippin*

Apple Tree. "Some years ago I told Mr. Knight, I thought I could preserve the Golden Pippin, and other of our old Apples, for garden culture, free from canker, by a little management in pruning. The Golden Pippin Apple I find to succeed better on a Crab stock,* than on the Paradise, or cultivated Apple. I began six years ago by selecting the most healthy shoot I could find, from an old Espalier Golden Pippin Tree, and grafted it on a true Crab stock near the root. The graft shot about a foot in length, and in the following month of March, I pruned away about one third of this shoot, leaving only the lower part which was perfectly ripened. This process of cutting away one third of all the annual shoots in the spring, has been repeated every year since, and I have now a fine young dwarf Golden Pippin Tree, as perfectly free from canker as any new healthy variety. But it will be necessary to continue this annual pruning, otherwise if the imperfectly ripened wood were left, it would be subject to canker." Mr. Williams exemplified this statement by transmitting annual shoots of the Golden Pippin tree thus treated; they had continued in a growing state till the middle of October, but all the wood formed after the middle of August, though it possessed sufficient vitality to the very ends to allow of elongation in the following spring and summer, yet being imperfectly ripened, would have become cankered through the whole of its length, whilst the wood

* "Stocks raised from the *seed* of the *Siberian Crab*, on a comparative trial with the English Crab, succeed best. The annual shoot of the Siberian Crab ceases to elongate after the month of August, the roots in course become less active in propelling the upward sap, hence the wood and buds of the grafts are more perfectly ripened in the autumn."

formed in the early part of the season, would have remained in a healthy and uncankered state.

John Braddick, Esq. transmitted to the Secretary, in a letter dated the 4th of March, an account of the following *Composition,* which he has used with much advantage, *for washing the branches of Fruit trees,* for the purpose of destroying the insects which harbour on them. He mixes one pound of flour of brimstone in three gallons of gas water, adding soft soap sufficient to make the liquid adhere to the buds and branches. The mixture is made over fire without danger. It is applied in the month of March, and has been used under glass on the most delicate trees, without doing them any injury. A considerable number of trees may be completely washed over in one day by a single person.

On the 18th of March, a paper by Mr. George William Johnson, of Great Tatham, in Essex, was read, detailing the result of some comparative experiments on the *Effect produced on Vegetables by the mixture of small quantities of salt in the soil.* In all the instances reported, though no very perceptible or important effect seemed to be produced on the plants, yet in the produce of seeds, in every case, there was a remarkable excess in favour of those treated with salt. In Celery, the produce was in the proportion of 4 to 3; in Brocoli of 22 to 19; and in Carrots of 14 to 19.

On the 6th of May, a communication was read from Mr. Edmund Malone, Gardener to George Savile Foljambe, Esq. of Osberton House, in Nottinghamshire, describing a mode of grafting on the large branches of old trees, which he

denominates *dovetail grafting*. The scion is selected so as to have two or three buds above where the knife is to be inserted. To prepare it for the operation, a slip is cut off the end of the scion, sloping towards the bottom, and as long as it is decided to insert it into the stock. On each side of the cut, as far as it extends, a part of the outer bark is taken off, leaving the under part of the cut portion of the scion broader than the upper part. The branch to be worked is thus prepared, being first cut off smooth and straight ;—two parallel slits, distant from each other *nearly* the width of the prepared scion, and the length of its cut part, are then made in the bark of the branch, observing particularly to slope the knife, so that the under edge of the cut next the wood, may be wider than the outer edge. The piece of bark between the slits must then be taken out, separating it at the bottom by a horizontal cut. The scion will slide into the dovetail groove thus formed, and if the work is well performed, will fit neatly and tightly. Two or three longitudinal slits should be made round the branch, to prevent the place into which the scion is fitted, from opening as the bark dries. A small quantity of the grafting clay should then be carefully applied, securing it on with a flannel or list bandage, the ends of which may be fastened with small nails. The top of the stock should be covered with clay, to secure it from wet, sloping it well up to the grafts. The length of the part of the scion to be inserted into the stock, should be about an inch and a quarter, and when preparing this part, there should be a bud left on the outside ; by this, the union of the scion and stock is accelerated and rendered more complete. When very large branches or trees are to be grafted, three or four scions should be inserted, placing them at equal

distances round the stock. By this arrangement, the sap will ascend equally on all sides, and every part of the stock will be preserved from decay.

On the 7th of May, Mr. THOMAS SHEA, Gardener to Lord BURGHERSH at Florence, communicated the following particulars of the *treatment of Orange and Lemon trees* in that part of Italy. He has observed, that throughout the winter, instead of being placed in Greenhouses as in England, by which means they are kept in a state of growth, they are put into sheds, the windows and apertures of which are only closed during frosty weather. At other times, the external air is freely admitted, the plants are watered only once or twice a month, and then sparingly. In the end of April, they are taken from the sheds and set in the open air. These plants are kept dwarf, and in large earthenware pots. In June they are manured with two handfuls of kiln-dried Lupines, mixed with double the quantity of Goat's dung, and this is covered with stable manure. Throughout the summer, the plants are very much watered; to a large plant, as much as five or six buckets every other day is given, and in very hot weather, they are watered daily. Every fourth or fifth year, the plants are lifted out of the pots, and the balls reduced, the external roots being taken off.

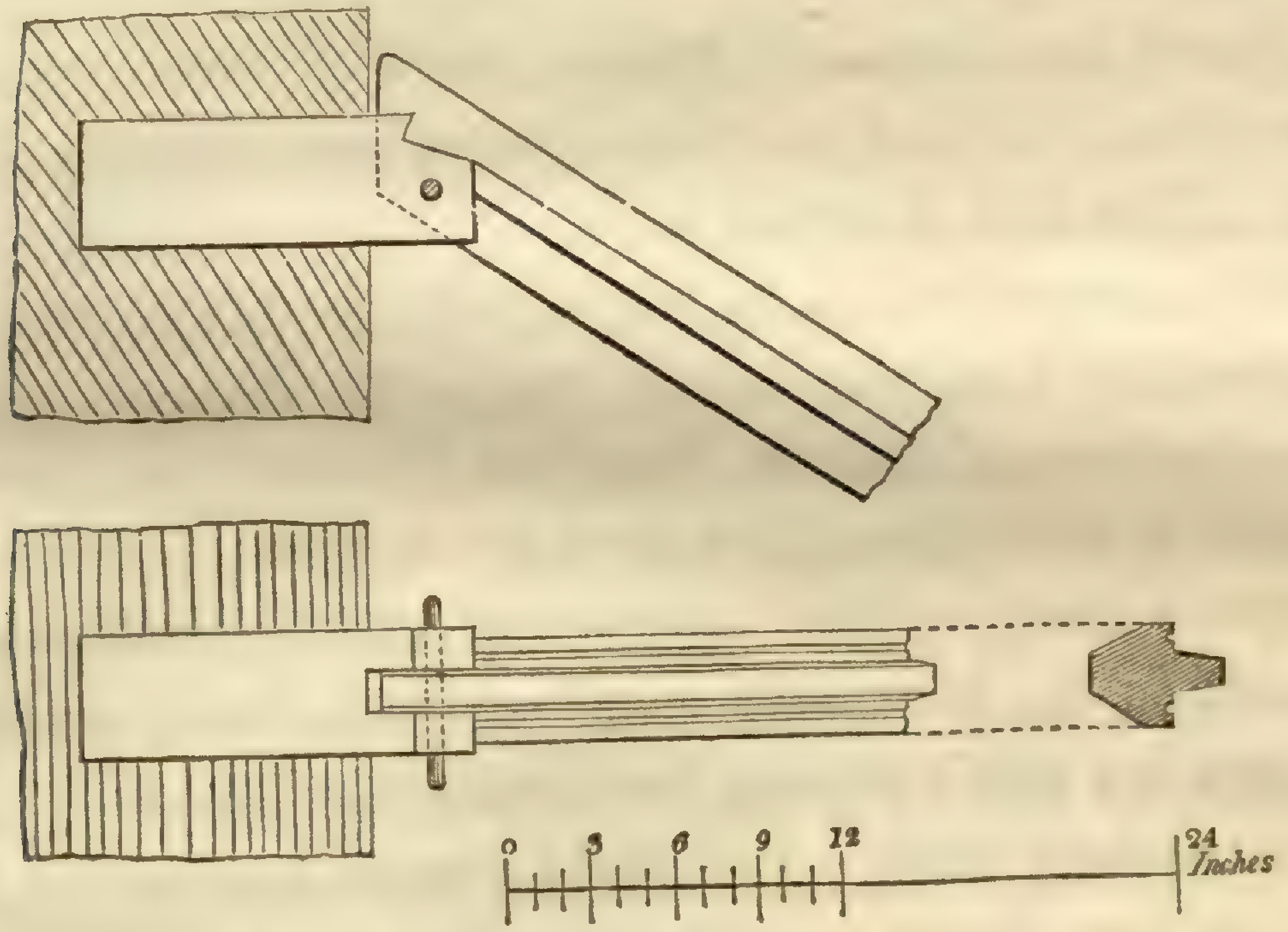
On the 3rd of June, Mr. JOHN WALMSLEY, Slate Merchant, of Belvedere Road, Waterloo Bridge, exhibited *a Trough made with Slates,* contrived by WILLIAM ATKINSON, Esq. who has used such at different places, where they have been found to answer better than any other material for Troughs for Greenhouses; or they may be made water-tight for aquatic

plants. The cost of these vessels is two shillings and two pence per foot, superficial measure. They may be made of any length not exceeding five feet. The most convenient size for Greenhouse plants or Creepers, is about three feet long, twelve or fifteen inches wide, and twelve or fifteen inches deep. The Slate is about three-eighths of an inch thick, rubbed to a smooth surface. The bottom is grooved into the sides and ends; and where joined at the angles, is secured by Iron screws to a triangular piece of Slate inside the Trough. Slate boxes have been adopted by Mr. Atkinson in consequence of wood soon rotting, and of the great inconvenience of renewing the boxes, without injuring the roots of the plants. The Slate Troughs are very durable, and may be painted any colour outside, and ornamented, if required.

A *Model of a block and portion of a rafter* were exhibited on the 17th of June, from the Garden of Gregory Gregory, Esq. at Rempstone, in Nottinghamshire. They were sent to illustrate a simple and effectual method of constructing temporary glass-houses for forcing any particular trees trained on the open wall. The blocks are permanently built into the wall under the coping, at such exact distances, that lights will fit in between any two of them, upon the moveable rafters which pin in to the end of the blocks. The lights employed are the same as are used for hot-beds or other purposes in the garden, and are applied in two lengths, forming any angle to the wall which the gardener may choose. Along the front of the border, a temporary dwarf wall is built opposite to the trees intended to be forced, in which upright glass, if required, is fixed, or the lights are brought down so as to rest on the wall, if no upright glass is used.

The flued walls generally used in the Northern counties, of course materially assist this method of forwarding a crop. In the insertion of the blocks into the wall, a provision must be made in the coping, such as will let the lights pass freely under it. The walls at Rempstone are so planned, that sixty feet of wall is allotted to three trees, and the flues are confined in their returns to that extent; this produces a uniformity in the application of the moveable houses. The temporary dwarf walls are constructed on arches, so as not to interrupt the roots of the trees.

Plans of the block and rafter.



Explanation.

The upper figure is a section of a part of a wall, showing the block built in it, and the rafter put in its place and held by a pin.

The figure below and corresponding with the upper one is a plan of part of the wall with the block fixed in it, and the rafter in its place; with a section of the rafter.

On the 15th of July, Aylmer Bourke Lambert, Esq. sent *specimens of Nuts,* which were quite plump and fresh. They had been preserved to so late a season, by a very simple but effectual process. When ripe they were put into a large brown earthenware pan, which when filled with nuts, was placed in a deep hole in a dry part of the garden. The top of the pan being covered with a flat piece of wood on which was put a heavy weight, the hole was filled with earth. By these means, Nuts may be kept in a fresh state till the season for gathering them from the trees returns.

Captain Peter Rainier, R. N. in a Letter to the Secretary, dated the 30th of August, detailed some particulars of the *effect produced on Pears by grafting them on Medlar stocks.* The fruit does not become inferior in flavour, and is certainly more juicy. The grafts make very vigorous wood, and invariably bear the second year after they are worked; the production of a crop does not prevent the growth of their wood, notwithstanding they are so young. Some Pears are altered much in their appearance by this treatment, as is instanced in the Jargonelle, which remains nearly green when ripe, and is a much shorter fruit than when produced from a Pear or Quince stock. Captain Rainier states that he has tried the experiment several years, but he has only worked his grafts hitherto on the branches of old medlar trees; he has however no doubt they would do equally well on young stocks.

LXV. *Notice of the* Siberian Bittersweet, *a new and valuable Cider Apple. In a Letter to the Secretary. By* Thomas Andrew Knight, *Esq. F. R. S. &c. President.*

Read September 19, 1826.

My Dear Sir,

I have enclosed in the box with the Plums* sent you this day, a few Apples of a variety, which, for the press, appears to me to possess a number of singular and good properties and qualities; and it is one, which I exclusively plant for the press, in this vicinity. The trees grow very rapidly, and are free from disease of any kind. During the whole period of ten years, in which alone the variety has existed, n o frost has been sufficiently severe to injure materially its blossoms, and I have in consequence obtained ten successive crops of fruit. The American Apple-bug (the Eriosoma Mali of our Transactions)† wholly avoids the trees. I have frequently inserted grafts into stocks, upon which those insects abounded, and upon which they had continued to abound; but I never saw more than one instance in which they were found upon the graft, and then it was just above its junction with the stock; and three days afterwards they had entirely disappeared. The fruit contains much saccharine matter, with scarcely any perceptible acid; and it in consequence affords a cider, which is perfectly free from the

* See page 529 of this Volume.

† See Horticultural Transactions, Vol. ii. page 162.

harshness, which in that liquor offends the palates of many, and the constitutions of more; and I believe that there is not any county in England in which it might not be made to afford, at a moderate price, a very wholesome and very palatable cider. This fruit differs from all others of its species with which I am acquainted, in being always sweet, and without acidity, even when it is not more than half grown.

When the juice is pressed from ripe, and somewhat mellow fruit, it contains a very large portion of saccharine matter; and if a part of the water it contains, be made to evaporate in a moderately low temperature, it affords a large quantity of a jelly of intense sweetness, which, to my palate, is extremely agreeable; and which might be employed for purposes similar to those to which the inspissated juice of the grape is applied in France. The jelly of the Apple prepared in the manner above described, is, I believe, capable of being kept unchanged during a very long period in any climate; the mucilage being preserved by the antiseptic powers of the saccharine matter, and that being incapable of acquiring, as common sugar does, a state of crystallization. I kept the inspissated juice of the Pear, and of the Apple, more than twenty years, without being able to observe any change in it. It neither attracted, nor parted with moisture, though it was covered only with paper. But it always contained an excess of acid, a defect from which the jelly of the Siberian Bittersweet is perfectly free; and it scarcely contains any perceptible degree of bitterness, that taste being given apparently by the essential oil of the rind alone. If the juice be properly filtered, the jelly will be perfectly transparent.

When I had last the pleasure to see you here, you thought the trees ornamental, when loaded with fruit; and at your desire I sent to the garden a plant of it under the name of the Siberian Bittersweet. It produces its leaves and blossoms rather early in the spring; and it will consequently be found to succeed best in somewhat elevated situations. It derived its origin from a seed of the Golden Harvey Apple, and pollen of the Yellow Siberian Crab.

I remain, my dear Sir,
sincerely yours,
Thomas Andrew Knight.

Downton, September 16, 1826.

Note by the Secretary.

The Siberian Bittersweet above described, became entitled, in the present year, to the prize annually given by the Herefordshire Agricultural Society, for the best new variety of Cider Apple.

LXVI. *An Account of Two Varieties of the* Mango Fruit, *which ripened in the Garden of the Earl of* Powis, *at Walcot Hall, in Shropshire. By* Joseph Sabine, *Esq. F. R. S. &c. &c. Secretary.*

Read November 21, 1826.

It is with great satisfaction that I have to address the Society upon the subject of the Mangoes which have lately been communicated to us by the Earl of Powis. The having succeeded in shewing that this delicious fruit may be procured under artificial management in Great Britain, and in sufficient abundance to form a not unfrequent part of the dessert, is so important a circumstance, that I feel called upon to acquaint the public, as speedily as possible, with the result of this very signal triumph of skill, and perseverance over difficulties, which have been hitherto considered insurmountable.

The Mango is well known to all travellers who have visited the tropical parts of the world, as being by far the best fruit which is generally produced in those regions, and as that which is uniformly the most grateful to an European palate. In such climates it is cultivated wherever the arts of civilization have penetrated; and it may there be said to hold the same station, among other fruit trees, as the Apple possesses in these more northern regions. Like the Apple, the number of varieties raised from seed of the Mango, is also very great; and of these, while some possess the highest

excellence, there are others in which the flesh of the fruit is so fibrous and ill flavoured as to resemble, as is commonly said, nothing so much as a mixture of "tow and turpentine."

Fortunately, both the kinds which are the subject of these observations, proved to be varieties of the highest excellence. They were purchased by Lord Powis in 1818, of the late Mr. James Lee of Hammersmith, by whom they were raised from seed sent to him from Jamaica. For the sake of commemorating the circumstance of these varieties having been first ripened under the auspices of that nobleman, I propose to call the one the Red Powis Mango, and the other the Yellow Powis Mango.

The *Red Powis Mango* was ripened in the Garden at Walcot, in the beginning of September; and the tree which bore it produced at the same time 35 other fruit of unequal size, but of equal excellence in flavour. In form it resembled a compressed oval, with one end a little curved inwards; the skin was of a rich olive colour, becoming green towards the apex, and being deeply stained on the exposed side with bright crimson breaking into spots of a darker colour. The flesh was deep yellow, filled with an abundant juice, very tender, but fibrous next the stone, from which it was inseparable. The flavour was sweet, rather luscious, highly perfumed, with a decided taste of turpentine, but diffused in such admirable proportion, as to produce a very agreeable and novel effect upon the palate. This resinous taste was more concentrated in the skin, in which it was combined with a slight proportion of acid. This variety is considered by Lord Powis to be very similar to that known in the East Indies by the name of the Alphonso Mango.

Of the *Yellow Powis Mango*, one fruit only was produced, which ripened in the beginning of October. The skin was of a pale dull yellow-ochre colour, a little brighter and more orange coloured towards the stalk, and covered over, when minutely examined, with numerous paler specks. In form it was similar to the other kind, but rounder, thicker, and less incurved at the apex. When fresh gathered it was covered with a delicate bloom, which it did not wholly lose after having been kept nearly a fortnight. It did not appear to differ much in taste from the first; perhaps it was a little more luscious, and also in a slight degree more fibrous. This variety was considered to approach that of the East Indian Mazagong Mango in appearance.

It does not appear that the management under which these Mangoes were ripened possesses much peculiarity. The plants are in pots, plunged in the tanpit of a good stove, which is maintained at a temperature of from 70° to 96° by means of a particular application of hot water. Lord Powis conceives that it is this mode of heating which has mainly contributed to force the plants to produce their fruit.

The accompanying Drawing, representing the two varieties, is from the faithful pencil of Mrs. Withers.

1 The Red Powis Mango.

2 The Yellow Powis Mango.

LXVII. *An Account of Ten Varieties of* Persian Melons. *By* Mr. John Lindley, *F. L. S. Assistant Secretary for the Garden.*

Read September 19, 1826.

The varieties of the Melon which are cultivated in the Gardens of Persia, have long been celebrated for their unrivalled excellence, and the concurring testimony of all travellers to this fact has been abundantly supported by the high merit of the few kinds that have from time to time found their way to Europe. It is therefore presumed, that the following account of ten varieties from that country, which have been ripened in the present season in the Garden of the Horticultural Society at Chiswick, will be found of sufficient interest to deserve attention. They are the produce of two parcels of seeds transmitted to the Society by Henry Willock, Esq.* His Majesty's Envoy at the Court of Persia; one in the year 1824, the other in the spring of the present year.

The Melons of Persia differ remarkably from the varieties commonly cultivated in Europe. They are altogether destitute

* This Society is indebted to Mr. Willock, for his unceasing exertion in attempting to transfer to England, several of the rare productions of Persia. The difficulty of conveying plants from such a distance, whence much of the journey is over land, has hitherto frustrated part of his endeavours. The new Persian Melons, however, will become, it is hoped, a lasting memorial of his efforts in the cause of useful Horticulture, whilst the re-establishment of the Rose Berberifolia from seeds sent by him, will be equally the cause of recording his services in the Ornamental Department of the Garden. *Sec.*

of the thick hard rind which characterises the latter, and which renders the one half of every fruit useless; on the contrary, they are protected by a skin so thin and delicate, that they are subject to injury from causes, which would produce no perceptible effect upon the Melons of Europe. Their flesh is extremely tender, rich and sweet, and flows copiously with a cool juice which renders them still more grateful. To these important qualities, they in many cases add the merits of bearing abundant crops of fruit, the appearance of which is always extremely beautiful.

But on the other hand, their cultivation is attended with peculiar difficulties. They are found to require a very high temperature, a dry atmosphere, and an extremely humid soil, while they are at the same time impatient of an undue supply of moisture, which causes spotting and sudden decay long before the fruit is matured. It is not therefore easy to maintain that necessary balance of heat and moisture, which in Persia arises out of the very nature of the climate and mode of cultivation. In that country we are told that the Melon is grown in open fields, intersected in every direction by small streams, between which lie elevated beds richly manured with Pigeon's dung. Upon these beds the Melons are planted. The Persian gardener has therefore to guard against nothing but scarcity of water, the rest is provided for by his own favourable climate. With us the atmosphere, the ventilation, the water and the heat, are all artificial agents, operating in opposition to each other. The most successful method of cultivation which has yet been practised, seems to be to supply the plants abundantly with water at the roots, but to give them as little as possible overhead; to combine

copious ventilation and high temperature by means of frequently renewed linings of hot dung, and to elevate each fruit a few inches above the soil by means of a slate laid upon two bricks placed side by side.

In the following descriptions I have arranged the sorts according to their degree of excellence, placing those first which are of the most perfect quality, and those at the end of the list which are of more doubtful merit. But upon this subject we are at present far from accurately informed. It has been lately understood from Mr. Willock, that some of the kinds now described are winter melons, which require keeping for some months before they are fit for table; a circumstance with which we were not made acquainted in sufficient time to ascertain which of the varieties, now about to be mentioned, are of that description. It is probable, that the Kurchaing and Goorgab Melons, the quality of which has been found to be very indifferent, as summer fruit, may acquire their flavour if treated as winter kinds. All the varieties are essentially distinct from the few Persian Melons hitherto known to England.

I. The Melon of Keiseng.

A beautiful egg-shaped fruit, eight inches long, five inches wide in the middle, six inches wide at the lower extremity, very regularly and handsomely formed. Colour of a pale lemon yellow; if carefully examined, evenly and minutely speckled with paler dots; finely and regularly netted all over, with a few cracks lengthwise; the meshes of the reticulation closer towards the base than at the apex. Stalk about

an inch and half long, separating from the fruit. Flesh from an inch and half to two inches and a quarter thick, nearly white, flowing copiously with a cool juice, extremely delicate, sweet, and high flavoured, very similar in texture to a well-ripened Beurré Pear. Rind firm, but so thin, that all the fleshy part of the fruit may be eaten.

This sort may be considered the very best of those now described. It resembles the Sweet Melon of Ispahan, noticed in the Transactions, Vol. iii. page 116, but differs in being closely netted all over instead of being smooth. The juice is as abundant and cool as that of a water melon, while the flavour is equal to the very best kind in cultivation. It is tender, but a great bearer, and ripens soon after the large Germek, No. 5. It derives its name from the village of Keiseng, near Ispahan.

II. The Geree Melon.

A handsome green fruit. In shape it is oval or ovate, and in size, it measures eight inches in length by four inches and a half in breadth. The skin is closely mottled with dark sea-green upon a pale ground, and is either netted or not; in the former case, the meshes are very close, by which character, it may be readily known from the Daree, which will be next noticed. When well ripened, various numerous longitudinal fissures appear upon the rind, which also has frequently, but not always, from nine to eleven short dark green streaks radiating from the apex. Stalk very short. Flesh an inch and half or two inches thick, bright green, melting, very sweet, and highly flavoured.

Till the Melon of Keiseng was tasted, this was esteemed the most highly of the Persian sorts, but it must yield to that variety, both in beauty of appearance and in excellence of flavour. It is equally rich perhaps, but neither so juicy nor so cooling. The flesh when in a state of decay, acquires a disagreeable pungent flavour, which is found indeed in all melons, but which is more distinct in this than in any other sort I have tasted. A good bearer, but tender.

Seeds of this variety were distributed, before the true designation was ascertained, under the name of the Ostrich Egg Melon, which must now be considered cancelled.

III. The Daree Melon.

This resembles the last in colour and many other points. It is of the same figure, but the rind when netted, exhibits coarser reticulations; like it, it is subject to become smooth. The principal differences are in the stalk, which is two inches and a hall long, and in the flesh, which is white, not green, thick, crisp, melting; when fully ripened very sweet, but rather insipid if imperfectly matured: it is always however cool and pleasant. It is generally larger and broader than the Geree, measuring nine inches by six, and is a much more abundant bearer.

Upon the whole, this must be considered a finer fruit than the Geree, but less highly flavoured. The Vines are unusually robust, and continue growing till the middle of September.

IV. The Melon of Seen.

A fruit of regular figure and handsome appearance, seven inches long, by five inches wide. Shape ovate, with a small mamelon at the apex. Surface, pale dusky yellow, regularly and closely netted all over, except the mamelon, which is but little marked. At the base the netting becomes confluent, and gives the coat a russet yellow appearance. Stalk easily separating; rind very thin; flesh from an inch and a half to two inches thick, pale green, sometimes becoming reddish towards the inside, exceedingly tender and juicy. Juice sweet, delicately perfumed, as cool as a water melon. A good bearer, but late in ripening.

The fruit is of the same degree of excellence as the two last, but is very different from those in appearance. It resembles the Melon of Keiseng in form and colour, but is neither so juicy, sweet, or high flavoured. Seen, from which the fruit is named, is one of the villages near Ispahan, whence this particular variety was procured.

V. The Large Germek Melon.

A heavy handsome ribbed fruit, generally weighing five or six pounds, shaped like a depressed sphere, usually six inches deep, but varying in breadth from seven to nine inches. At the apex is situated a corona,* varying from an

* The corona of a Melon is the area at the apex, included within a circular scar, which indicates the place whence the flower dropped. In common Melons, it is generally obliterated, but in a few of the Persian kinds, it is very obvious. In the Gourd tribe, it is that remarkable protuberance of the apex, which gardeners call the Turban, and which gives its name to the tribe named Turban Gourds.

inch to two inches in diameter. Surface sea-green, so closely netted, that it presents the appearance of shagreen leather. Rind very thin. Flesh an inch and three quarters, or two inches thick, clear green, becoming paler towards the inside, firm, juicy, very rich and high flavoured.

This is an excellent variety, ripening the first of all the sorts except the next, both in this country and in Persia, where it is highly esteemed for the property it possesses of arriving speedily at a bearing state. It is very prolific, and produces larger fruit than any Persian variety with which I am acquainted. The Vines are so hardy as to be capable of yielding spontaneously a second crop. Young fruit under such circumstances are now (September 15,) setting, and the plants are as healthy as they were in July.

Received from Mr. Willock, under the name of "an early round Melon, called generally Germek, grown at Casween."

VI. The Small Germek Melon.

This ripens about a week earlier than the last, but is by no means so valuable a fruit. In form it is a depressed sphere with about eight rounded ribs, measuring four inches in depth, by four inches and a half in width. The skin is even, yellowish, with a little green about the interstices, obscurely netted, with a very wide corona. The flesh is green, inclining to reddish in the inside, an inch and a half thick, juicy, and high-flavoured. Skin very thin. The pulp in which the seeds are immersed is reddish. The fruit is sometimes produced late in the season with no corona. An

indifferent bearer, the Vines being tender, and apt to die before the fruit is ripe.

Sent by Mr. Willock in 1826, under the name of "Talibee Germek."

A sort resembling this, but with red flesh, was raised from seed transmitted by Mr. Willock in 1824, under the name of the Germek, but it proved of bad quality, and is therefore not further noticed.

VII. The Green Hoosainee Melon.

A handsome egg-shaped fruit, five inches long by four inches broad; when unripe of a very deep green, but in maturity acquiring a fine, even, light green, regularly netted surface, which on the exposed side becomes rather yellow. The flesh is pale greenish white, tender and delicate, full of an highly perfumed, pleasant, sweet juice. The rind is very thin; the seeds unusually large.

This is a variety of much excellence; it is a great bearer, and hardier than any except the large Germek. It was received from Mr. Willock, in 1824, under the simple name of Hoosainee.

VIII. The striped Hoosainee Melon.

This is the handsomest fruit, both as to form and colour, with which I am acquainted, and an excellent bearer. It came from Mr. Willock in 1826, under the same name as the preceding, but is different both in appearance and character. In figure it is ovate, measuring five or six inches in length, by four or five inches in breadth at the widest part.

The rind is very thin, mottled, and striped with bright yellow, and deep olive-green intermixed, the two colours being blended by irregular imperfect reticulations, which overspread the surface. The stalk is short; the flesh an inch and half thick, quite white, crisp, juicy, and sweetish, but not high flavoured.

As this ripens the last of all the varieties, it is possible that its want of flavour is attributable to the weather we experience at the period of its maturity.

IX. The Kurchaing Melon.

A remarkably handsome oval melon, ten inches by five. Skin a beautiful lemon-colour, split in a few places, and netted very irregularly; stalk separating, but not very long; flesh white, less juicy than any of the preceding, extremely delicate, but not high flavoured.

This, which like the next, derives its name from a small village near Ispahan, is inferior in flavour to any of the preceding, but is a pleasant fruit. It is not however of much importance, and is an indifferent bearer. Probably a winter melon.

X. The Melon of Goorgab.

An oblong fruit, rather wider at the base than the apex; about seven inches and a half long, by four and a half broad. Stalk an inch and half long; rind yellowish dull green, thickly dotted with dull yellow, coarsely cracked, and netted all over with many irregular paler reticulations. Flesh white, firm, dry, insipid. It is supposed that this will prove to be a winter melon. This is much lighter than any other variety of Persian Melon which I have seen.

As a conclusion to these remarks, it may be useful to state, that besides the above kinds, the following varieties of the Persian Melon are known to have been cultivated in this country, and are inserted in the Catalogue of Fruits in the Society's Garden, now in the press, viz.

1. Sweet Melon of Ispahan ; described in the Transactions, Vol. iii. page 116.

2. Dampsha, or Zamsksy, described in the Transactions, Vol. iv. page 211.

3. Green Persian Melon.

4. OLDAKER'S Persian Melon.

The two latter have not yet been described.

LXVIII. *Report on* New or Remarkable Esculent Vegetables, *cultivated in the Garden of the Horticultural Society during the year terminating on the* 31*st March*, 1826.

Read August 1, 1826.

THE accounts of particular classes of *Esculent Vegetables*, which have been published from time to time in the Transactions of the Horticultural Society, are a part of the plan of a general description of the different subjects belonging to the Kitchen Garden Department, which, it is hoped, in the course of time will be completed under the auspices of the Society. These monographs, as they may be termed, were supplied by private individuals previously to the establishment of the Garden; subsequently they have been prepared in the Garden, either by, or under the immediate superintendance of the chief Officers of the Society.* A

* The monographs of the first description are, On Savoys and Winter Greens, by Mr. MORGAN, Vol. ii. page 307. On Brocolis, by Mr. RONALDS, Vol. iii. page 161. On Beet roots and Beet leaves, by Mr. MORGAN, Vol. iii. page 272. On Tomatoes, by Mr. SABINE, Vol. iii. page 342. Of those prepared under the direction of the Officers of the Society, the following are the titles: On Onions, by Mr. STRACHAN, Vol. iii. page 369. On Spring Radishes, by the Same, Vol. iii. page 436. On Autumn and Winter Radishes, by Mr. CHRISTIE, Vol. iv. page 10. On Carrots, by the Same, Vol. iv. page 383. On Endives, by Mr. MATHEWS, Vol. vi. page 133. On Parsneps, by the Same, Vol. vi. page 302. In addition to these must be mentioned the learned and interesting Paper on the plants belonging to the Genus Brassica by M. DE CANDOLLE, which is printed in the Transactions of the Society, Vol. v. page 1. Full descriptions and accounts

succession of these, it is designed, shall be produced until the whole are supplied; but as, in the interval, additions, further information, or perhaps corrections relating to the subjects already treated on, may be obtained or required; or extraordinary novelties in the classes yet unpublished may arise, on which information to the Members of the Society may be desirable earlier than it would be communicated, if the entire account was to be waited for; it has been deemed expedient to prepare annually a Paper on such miscellaneous subjects as the Kitchen Garden shall afford in each season. The present is the first communication of this nature. These Annual Reports may therefore be considered, firstly, in the nature of supplements to the former monographs, and secondly, as affording some notices of matters which will be introduced into future monographs. They will also include notices of such individual subjects, or such small classes of vegetable esculents, as are not of sufficient extent to supply detached Reports, but respecting which there may exist information sufficiently perfect to be given to the public.

of several single esculents have also appeared in the Transactions, of which the following are the most important: On Sea Kale, by Mr. MAHER, Vol. i. page 13. On the French Turnip, by Mr. DICKSON, Vol. i. page 26. On Samphire, by Mr. BRADDICK, Vol. ii. page 232. On Vegetable Marrow, by Mr. SABINE, Vol. ii. page 255. On Lathyrus tuberosus, by Mr. DICKSON, Vol. ii. page 359. On the Rampion, by Mr. DICKSON, Vol. iii. page 19. On Celeriac, by Mr. SABINE, Vol. iii. page 71. On Succory, by Mr. OLDAKER, Vol. iii. page 138. On Tetragonia, by Mr. ANDERSON, Vol. iv. page 488. On Water Cress, by Mr. BELLENDEN KER, Vol. iv. page 537. On Perennial Kale, by Mr. SINCLAIR, Vol. v. page 297.

Coúve Tronchuda.
Portugal Borecole.
Large Ribbed Borecole.

For the knowledge of this most valuable vegetable, the country is indebted to the exertions of James Warre, Esq. who at various times obtained the seed from Portugal, and so extensively distributed it, that the plant is getting into cultivation in all those well cropped gardens where the proprietor or the gardener is anxious about his esculents. This Cabbage is of a character entirely new to English gardens; but the French have a class which they call Choux à grosses côtes and Choux à larges côtes, which belong to the Brassica costata (Large Ribbed Cabbage) of M. De Candolle,* and the Coúve Tronchuda has much resemblance to their Chou vert à larges côtes. The first introduction of it by Mr. Warre was in 1821, when he presented seeds of it to the Horticultural Society. The stalk is short and thick; the outer leaves are very large, roundish, of a dark bluish green, rugose on the surface and slightly undulated; the costa or midrib of the leaf is large, thick, and nearly white, branching into veins of the same colour. The plant forms a loose open head, and when full grown is nearly two feet in height. A Cabbage of inferior quality has occasionally been received from Portugal under the same name, which runs into flower rapidly without attaining any size, and is in no way productive or useful. The genuine sort is much grown about Braganza, and the name of that town is often attached to the variety now

* See Horticultural Transactions, Vol. v. page 12.

described. The cultivation of it is confined to the province of Tras-os-Montes, and the other northern parts of Portugal. Different parts of the true Coúve Tronchuda are applicable to culinary purposes. The ribs of the outer and larger leaves when divested of the thin green parts and well boiled make a good dish, somewhat resembling Sea Kale. The heart or middle of the plant is however the best for use; it is peculiarly delicate, tender, and agreeably flavoured, without any of the coarseness which often belongs to the Cabbage tribe. The plants are too tender to endure the frosts of our climate; they cannot therefore be cultivated as winter greens. The young seedlings should be preserved under frames during winter, to be planted out at the same time as Cauliflowers for an early summer crop, and the succession must be kept up by spring and summer sowings. They require a well manured soil.

Dwarf Coúve Tronchuda.

This is much earlier and dwarfer than the preceding, being when full grown only from fifteen to eighteen inches in height; the leaves are middle sized, rounded, smoother and flatter on the surface, and form a small loose head. When the lower leaves are taken off for use, the plant throws out numerous sprouts or shoots from the lower part of the stem, which is not the case with the preceding variety. Seeds of this were sent from Lisbon to the Horticultural Society by the late John Jeffery, Esq. in 1822, and were also presented by the Duke of Bedford to the Garden in 1824. From information communicated by Mr. Warre, it is conjectured that this variety is distinguished in Portugal by the name of

Murcianâ, from the town of Murça, which, as well as Braganza, is situated in the north of the kingdom, in the province of Tras-os-Montes.

Vanack Cabbage.

This Cabbage approaches nearer to the kind cultivated in the Garden of the Society under the name of the Early Russian Cabbage, than to any other in the collection. The outer leaves are large, of a dark green, strongly veined and spreading; the head is somewhat irregular in shape, very broad at the base, and terminating rather sharply; the colour of the head is a palish green, and the ribs are in general paler than the other part of the leaves. Seeds of this variety were presented to the Society by Mr. Thomas Torbron, Gardener to the Countess of Bridgewater, at Ashridge in Hertfordshire. It was in more general cultivation some years since than at present, and was in particular much grown in Sussex and Hampshire. It is not now to be found in the printed lists of the principal seedsmen, nor is it mentioned in the Gardening Manuals. Mr. Torbron had cultivated it in the garden of the Earl of Egremont at Petworth so long since as the year 1776, under the name he still gives to it. It is the only hearting Cabbage he keeps in his garden. By timely sowings it is always in season; it makes excellent Spring Coleworts, becomes a white hearted Cabbage very early, and pushes fine sprouts from the stump after the Cabbages are cut. In quality it is inferior to none of the best Cabbages.

Neapolitan Borecole.

Chou de Naples.
Chou de Naples frisé nain.
Cavolo torsolo ricciuto.

This Cabbage will attract notice more on account of its appearance than its utility. The stem is short and thick, forming on its top, a few inches above the ground, a bulb, inclining to oval; from all parts of the bulb spring numerous erect small leaves, finely curled on their edges. The whole plant does not exceed twenty inches in height; the leaves are attached to footstalks, six or seven inches long; they are obovate, smooth on the surface, with an extraordinary quantity of white veins nearly covering the whole of the leaf. The fringed edges are irregularly cut and finely curled, and so extended as nearly to conceal the other parts of the leaf. As the plant gets old, it throws out numerous small branches from the axils of the leaves on the sides of the bulb. Seeds of this curious variety were received from M. Vilmorin of Paris, and were also brought from Italy by Roger Pettiward, Esq. and presented to the Society. It is not mentioned in the Bon Jardinier of 1825 or 1826. M. Noisette, in the Manuel Complet du Jardinier, classes it with the Choux-verts (or Greens), but it more properly belongs to the class of Choux-raves (or Turnep Cabbages), and is perhaps the same as the Chou-rave crêpu of M. De Candolle,* which he says is cultivated at Naples under the name of Pavonazza. It is too tender to bear the winter of this country, but if sown in March, it continues fit for use during the autumn. It is not however to be put in competition as an useful vegetable with our Scotch Kale.

* See Horticultural Transactions, Vol. v. page 19.

Potatoes.

The collection of varieties of this vegetable in the Garden of the Horticultural Society is very extensive; considerable attention has been bestowed on the description of them, and in the examination of their comparative merits; but it will require much time before a monograph on them can be laid before the Society. Selections of new, curious, or particularly useful sorts, will therefore be occasionally made and descriptions of them published, until a general notice of the whole can be communicated.

Golden Potatoe of Peru.

The variety of the Common Potatoe, cultivated in Peru under the name of Papas Amarillas or the Golden Potatoe, has long been considered of importance to be procured, and was consequently the object of constant instruction to the correspondents of plant-collectors resident at Lima and in the adjacent countries. The Horticultural Society was fortunate in first obtaining it in a state fit for cultivation. It was transmitted to the Society by the late James Cowan, Esq. and received from him in May, 1823. The stems of the plant are tall, of a light yellowish green, naked at the bottom, branching and very straggling; the leaflets are light green, much wrinkled, slightly undulated, and acuminate, thinly set on long footstalks; the pinnulæ are numerous. The flowers are white, large, and numerous, growing on long peduncles, and forming large trusses; they are slightly fragrant, a circumstance in which they differ from other varieties. The tubers are small, irregularly shaped, but approaching to globular; their skin is pale yellow, and nearly smooth; the

flesh is a rich yellow, much deeper than in any other old known sort. When cut through in the raw state, it appears of very close firm texture, and exhibits an irregular line placed at some little distance from the outside, but running out to the edge at the base of each eye. This line of division is more or less conspicuous in all Potatoes, being in fact the separation of the outer coat or bark from the interior flesh of the tuber. When dressed the Golden Potatoes are waxy, and of a peculiarly pleasant flavour. It is a late kind, and an indifferent bearer, when grown in a strong soil, but tolerably productive in a lighter. Though very good, this anxiously expected root has not turned out of such extraordinary excellence for the table as was anticipated, nor answered the expectations which the extravagant accounts of travellers in South America had induced us to form of it.

Pied Golden Potatoe.

This does not differ from the preceding in its stems or foliage; its flowers also have a slight fragrance. The tubers are irregularly rounded, with large eyes; the skin is pale yellow, striped with pale purple bands of various breadths. The flesh, both raw and when boiled, is exactly similar to that of the Golden Potatoe, and exhibits strongly the same line of separation of the outer coat and flesh. In time, and quantity of produce, it also agrees. Roots of this kind were presented to the Society by Charles Holford, Esq. in March, 1824.

ASPARAGUS POTATOE.

This Potatoe, whether it be dressed plain or with sauces, is in much estimation where it is known; its size prevents it being cultivated where productive crops are wanted; but its excellence for the table will always insure its growth in a garden where a variety of good esculents is required to be produced. The stem is dull green, tinged with purple in places, as well as at the joints, erect, branching, short-jointed, and of dwarf growth. The petioles are short; the leaflets light green, very small, hirsute, acuminate, and slightly involute, not numerous; the pinnulæ few and minute. It is very shy in producing its flowers; these are white and small, growing on short peduncles. The tubers are oblong, slender, varying in size, often from seven to eight inches long; skin of a light brownish white, inclining to pale red, smooth with numerous distinct eyes. Flesh very pale, firm and waxy, of superior flavour. It is a good bearer, but late in ripening; the eyes are also late in shooting, so that the stems are tardy in appearing above ground.

MOUSE POTATOE.

The original sets of this singular little Potatoe were sent to the Horticultural Society by His Royal Highness the Grand Duke of SAXE WEIMAR, in 1820, in a collection consisting of several varieties. It is called in the German Monograph on Potatoes by BERTUCH, printed at Weimar in 4to. in 1819 (where it is figured as well as described, No. 20, page 21. Tab. 6, fig. 20) the Kleine Schottlander Kartoffel (Little Scotch Potatoe) and Kleine Mauschen Kartoffel (Little Mouse Potatoe.) It is of dwarf growth. The stems are dull purple, naked, with close joints; the petioles are short; the

leaflets of a light green, small, ovate, and slightly undulated at the base, not numerous; the pinnulæ are few, and in general flat. The blossoms are few; the flowers pale lilac. The tubers are very small, oblong, slightly curved, and generally pointed at one end; their skin is smooth, with a few small eyes. Its flesh is very pale, almost white whilst raw; when dressed it is waxy and very good. A most abundant bearer, but late. From one of its names, it is probable it is of Scotch origin. In Germany it is said to be much cultivated by the curious. Its diminutive size will prevent its being grown, except as a matter of luxury. For all the purposes in cookery in which small Potatoes are required, it will prove very acceptable, and perhaps be considered even a greater delicacy than the Asparagus Potatoe.

Pine Apple or Cone Potatoe.

This singular root has received the above names from its peculiar formation. Below each eye is a projection, and as these are numerous and regularly disposed, it has some resemblance in shape to a Pine Apple, or more perhaps to the Cone of a Stone Pine, after the scales have expanded by heat. It is not uncommon in curious collections, having been received from various persons since the year 1821. It is of dwarfish growth, with strong dull green stems, tinged with brown in places, with close joints, much branching and straggling; the petioles are long; the leaflets few, dark green, very small, hirsute, oblong and plane, they are often bipinnate; the pinnulæ are numerous, minute, cordate. The plants are very shy in flowering; the flowers are yellowish white, growing on short peduncles, and forming small compact trusses. The

tubers are oblong, middle sized, generally pointed at one end, and with an irregular surface; the skin is smooth, yellow, with numerous eyes deeply sunk. In some of the roots the angles or protuberances are flattened, they have then a greater resemblance to a Pine Apple. The flesh when raw is of a pale yellow; when dressed, of good flavour and waxy. It is a moderate bearer, but very late.

Spanish Dwarf Potatoe

Is so very different in its appearance from every other variety of Potatoe which is cultivated, that it attracts the attention of almost every person who sees it. It is so dwarf as not to exceed four inches in height; its stems rather spread on the ground, they are dark green, strong, branching, and hairy; the joints are very close; the leaflets dark green, hirsute, and slightly undulated; the petioles rather long; the pinnulæ numerous. It does not produce blossoms. The tubers are oblong, middle sized, with few eyes, their skin yellow and smooth; the flesh yellow; when dressed they are tolerably good, and mealy. The sets continue a long time dormant, and do not shoot so as to show above the surface of the ground, till after some of the early varieties are fit for use. By this it escapes all injury from spring frosts. It is a moderate bearer, and late in ripening. The roots were originally received from the late Mr. John Sweet of Bristol, in the nursery of whose succeeding partner, Mr. John Miller, of that place, they have been some time cultivated. Mr. Sweet procured the sort from Sherborne in Dorsetshire, under the name now given to it.

Union Lettuce.

This is an excellent summer Cabbage Lettuce, hearting well, of good size, and remaining long without running to seed. It has acquired much reputation amongst the seedsmen, and has been circulated pretty extensively by Mr. Hugh Ronalds, of Brentford, from whom the Society first obtained it. It has also been raised in the Garden under the name of the Imperial Lettuce, and it appears to be the same which is called Laitue Turque, and Laitue Impériale, by the French gardeners. The leaves are of a yellowish green colour, very large and plain; the outer are much expanded, and slightly undulated; the inner somewhat wrinkled, and forming a close head. It cabbages freely, but is not very firm, though of good quality.

Black Seeded Gotte Lettuce.

A small spring Cabbage Lettuce. It grows very close to the ground. Its heart is hard and firm, about four inches in diameter when stripped of the outer leaves. Colour very pale green. The leaves are thin and nearly round, rugose, waved on the edges. This Lettuce comes early into use, and has besides much excellence as respects its flavour; but its chief merit is that it remains longer than almost any other before it runs to seed, and even sometimes bursts before its flower stem is formed. It is the smallest of all the kinds of Cabbage Lettuce, except the Tennis Ball, from which it differs in its leaves being more curled, and of a lighter green colour, and by not running to seed so soon by three weeks or a month. This Lettuce is derived from the French gardens, in which there are several sorts of early

Cabbage Lettuces, known by the name of Gotte or Gau, and both with black and white seeds; some of them however run quickly to seed, and have therefore little merit except for forcing. The variety now described has black seeds, and this circumstance should be particularly attended to, in obtaining it from the seedsmen, the white seeded kinds running early. It is called by the French gardeners, Laitue Gotte à graine noire lente à monter.

Ice Lettuce.

Seeds of this Lettuce were brought from the United States, under the above name, by Mr. David Douglas, in 1823, and it was raised the following year. It belongs to the division of Silesian or Batavian Lettuces, and must not be confounded with the Ice Lettuce of Scotland, which is our White Cos Lettuce. The leaves are of a light shining green, blistered on the surface, very undulated, and slightly jagged round the edges, they grow nearly erect, being eight inches long, and five or six inches broad. The outer spread a little at the top, but grow very close at the heart. It blanches without tying up, and becomes very white, crisp, and tender. It comes into use with the White Silesian, from which it differs, as it also does from any other of its class, in being much more curled, having a lucid sparkling surface, whence probably its name, and not turning in so much at the heart. It lasts as long in crop as the White Silesian.

Proliferous Leek,

Is a variety of the common Leek, being viviparous, that is, it produces young plants on its flower stalk, instead of

flowers. The leaves do not differ in appearance from the common Broad-leaved Leek, and the plant in its young state, before it runs to flower, exactly resembles it. The flower scape is from two to three feet high, producing a compact irregular globose umbel, composed of numerous small bulbs, intermixed with flowers. Some of these bulbs occasionally produce a second umbel, on scapes of from six to eight inches in length, but of much smaller dimensions than the principal one. The original plants of this Leek were received in 1823, in the garden of the Society, from Mr. Joseph Kirke, of Brompton, under the name of Tree Leek. It is increased by planting the young bulbs which are produced on the scape, and when only a small supply of Leeks is required in a garden, it would be desirable to get them by planting these, instead of raising them from seed. The young bulbs should be put into the ground when they have become well formed, and consequently ready to put forth roots, which is in the month of August. They should be set out in rows, like other Leeks. The bulbs will remain sound several months after they have ripened, so that they may be sent to considerable distances, and will keep good out of ground until the spring.

Flanders Spinach.

This is a winter Spinach, the seed of which was received from M. Vilmorin of Paris, as Épinard de Flandres à très larges feuilles, and is far superior to the Prickly or Common Winter Spinach, which is in general cultivation during the winter season in our gardens. It is equally hardy, perhaps hardier. The leaves are doubly hastate, and somewhat

rugose; the lower ones measure from twelve to fourteen inches in length, and from six to eight in breadth, they are not only larger but thicker, and more succulent than those of the Prickly Spinach. The whole plant grows more bushy, and produces a greater number of leaves from each root, and it is somewhat later in running to seed. The seeds are like those of the round or summer Spinach, but larger; they are destitute of the prickles which distinguish the seeds of the Common Winter Spinach.

New Zealand Spinach. Tetragonia Expansa.

This very useful substitute for Spinach, since it was first brought into notice by Mr. Anderson's Paper* in the Transactions of the Horticultural Society, has been very generally cultivated in gardens. The great advantage it possesses, is that of supplying fresh leaves in a state fit for use through the whole summer, even in the driest weather when the crops of summer Spinach are useless; this has made it a great favourite with gardeners; and though perhaps, generally, it is not considered so delicate, when dressed, as Spinach, yet by several it is preferred. It has been found to be both hardier and easier to manage in the open border of the garden, than was at first supposed; and it is also sufficiently productive of seeds. Mr. Anderson, in the Paper above referred to, and the Rev. Mr. Bransby, in a subsequent Paper,† both recommended its being planted over rotten dung: but this seems not necessary, for it grows perfectly well in a common well manured border. The seeds

* See Horticultural Transactions, Vol. iv. page 488.

† See Horticultural Transactions, Vol. v. page 282.

must be raised in heat, and the plants kept singly in small pots till the end of May, or beginning of June, when they should be turned out into the open border destined for them, and protected by hand-glasses from the frost, the mould being also well watered. The plants should be at nine feet distance from each other, and will soon fill up the intervals. From three to ten plants should be put out, according to the number of the family to be supplied with the produce.

Sea Beet. Beta Maritima.

The leaves of this Beet have been of late years ascertained to be an excellent substitute for Spinach, and are even preferred by many to that delicate vegetable. There are two distinct varieties of it cultivated in the garden of the Horticultural Society. They are perennial, and, if planted in a good soil, will continue to supply the table with their leaves for any number of years. The readiest method of increasing them is by seeds, but they may be multiplied to a small extent by dividing the roots. The early produced leaves are the best, and these are fit for use from the middle of April, until the plants begin to run to flower; but they may be continued in perfection through the whole summer and autumn by cutting off the flowering stems as they arise, and thus preventing the blossoming.

English Sea Beet.

This is the common state of the species. The plants which are grown in the garden of the Horticultural Society were sent from the sea coast of Sussex, between Worthing and Lancing, by Mr. Henry Phillips, as a new vegetable, in

1822. It is a dwarf spreading plant, with numerous angular leafy stems, much branched, and trailing along the ground. The lower leaves are on long foot-stalks, ovate, about three or four inches long, of a thick fleshy substance, dark green, and waved at the margin. The upper leaves, or those which grow on the stem, are smaller, and nearly sessile.

Irish Sea Beet.

This differs from the preceding variety in the greater size of its leaves, which are also of a paler green, the stems are not so numerous, and it appears to be rather earlier in running to flower. The external differences are however but trifling; but in flavour, when dressed, this is far superior to the other variety. Roots of this kind were presented to the Society's Garden by Daniel Giles, Esq. who obtained them from the garden of the late William Parnell, Esq. in the county of Wicklow, in Ireland.

German Rampion. Œnothera Biennis.

The common Evening Primrose of our flower gardens affords an useful addition to our esculent roots. It is so well known as an ornamental plant, that an entire description of it is unnecessary. The root is the only part used; this when fully grown, is generally from twelve to fourteen inches long, fusiform, occasionally with a few strong fibres, whitish on the outside, and white within. It has a thick strong outer coat which separates readily from the inside, and this it is necessary to remove, when the root is eaten raw. In that state it possesses a nutty flavour, but it is inferior to the Rampion, having a slight pungency. On the whole, however, it is agreeable. It

is supposed to act as an incentive to wine drinking, whence the Botanical name of the genus. If required as a raw salad it should be eaten young. When they are fully grown, the roots are usually dressed in the manner of Skirrets, or Scorzonera, in Germany, where it is sold regularly as a kitchen vegetable, under the names of Rapunzel, Rapunzel Zellerie, Wurzelrapunze, Rapontika. It was sent to the Society by Mr. Booth of Hamburgh, as the Yellow-rooted Œnothera. In France the genus is named Onagre, and this particular species is sometimes called Jambon des Jardiniers, and under this name it was received by the Society from M. Vilmorin, being also called Onagre Bisannuelle. It does not however appear as an esculent in the Bon Jardinier, nor in any other of the French works on gardening. The seeds should be sown in May, in a moist shaded border, best perhaps under a north aspected wall. If it is grown in too dry and exposed a part of the garden, or sown earlier in the spring, it is apt to run to flower during the summer, which renders the roots useless, for they then become hard.

Long Salmon Radish.

Seeds of this variety have been received from English, Dutch, and French seedsmen under the following names: Salmon, Early Salmon, Early short-topped Salmon, Long Salmon, Rave Rose or Saumonée. In the description of the varieties of Spring Radishes, published in the third volume of the Transactions of the Horticultural Society, page 440, this sort is considered synonymous with the Scarlet Radish, from which however it differs, and it is now noticed that the error which appears to have been there made, may be corrected.

The neck of the root rises about an inch above the ground like that of the Scarlet, but it is a paler red, and this colour gradually becomes lighter towards the middle, where it is a pale pink, or salmon colour; from the middle the colour grows paler downwards, and the extremity of the root is almost white. In shape and size, this Radish does not differ from the Scarlet, neither does it appear to be earlier, or to possess any qualities superior to the Scarlet Radish, the beauty of which, as grown for the London market, exceeds that of any other Long Radish. The Salmon Radish is not therefore likely to be an object of attraction, but it is necessary it should be noticed as a distinct variety.

Small Salad Lettuces.

The French, who pay more attention to the composition of their salads than the English, have increased the number of small herbs which they use for that purpose very extensively. Amongst others, they cultivate some species of Lactuca, which are grown in drills and cut young like small salading. Of these the following are worthy of notice.

Spinach Lettuce. Laitue Épinarde,

Is a distinct species of Lettuce, and known to botanists as Lactuca Quercina, its leaves having some resemblance to those of the Oak; these are about six inches long, lyrate and flat, with obtuse entire segments of a pale yellowish green, and mild flavour. It has no disposition to form a heart; and is never planted out singly. It runs to flower soon; later, however, than the following, and it is tolerably productive of leaves. It is fit to cut in its drills, in which it is always sown,

when the lower leaves are about five or six inches long; and if not then taken off too short, will afford a second cutting. It is of course to be sown early with other spring salad seeds, but lasts well through the summer.

Endive-leaved Lettuce. Laitue chicorée.

This Lettuce is called by botanists Lactuca Intybacea, from the resemblance its leaves bear to those of the Curled Endive. The lower leaves are small, lyrate, sinuated, and irregularly lobed, with sharp teeth, rather broad at the top, and of a pale green colour. When young, the plants have very much the appearance of Green Curled Endive. It runs to flower much earlier than the Laitue Épinarde, and is consequently less useful. It should be sown thick in drills, and cut when about three or four inches in height. The time of its being sown, and its uses, are the same as those of the preceding.

Salad Cabbage Lettuce.

This is a small pale green Cabbage Lettuce, with roundish entire leaves, a little dentated at the base, about four inches long, and three inches wide, slightly wrinkled. It is to be sown thick in drills, and does not then form any heart; it comes rather later into use than either of the two preceding small Salad Lettuces. If planted singly, it forms a small loose heart, being something like our common White Cabbage Lettuce, of which it seems to be a variety. It runs soon to seed. The seeds are sent from France, under the name of Laitue à couper, or, Laitue petite: it is distinguished from those early Lettuces which are called Laitues

Gottes, and Laitues Crêpes, by having smaller leaves, but it has otherwise much affinity to those kinds.

Golden Cress.

This is rather slower in growth than the Common Cress. The leaves are of a yellowish green, flat, oblong, crenated,both and entire, and of a much thinner texture than any of the varieties of the Common Cress. It is very dwarf, and is consequently short when cut as a salad herb for use. It has a mild and delicate flavour. When run to flower, it does not exceed eighteen inches in height. Seeds of this Cress were received from M. Vilmorin, under the name of Cresson Doré; it is at present but little known in this country, but certainly deserves more general cultivation, as it affords a pleasant addition to our stock of small salads. In the notice of it in the Bon Jardinier, it is treated as a variety of the Common Cress, Lepidium sativum, but it is probably a distinct species.

Garden Picridium. Picridium vulgare.

This is cultivated in the Italian gardens; its leaves when young being gathered to mix in salads. Seeds of it were first received from France in 1822. Whilst young the leaves are numerous, spatulate, cordate at the base, and clasping the stem; they vary, however, very much in their shape and character. Their flavour is pleasant, they are produced abundantly, and grow quickly. If sown in the spring, the plant runs to flower about the beginning of June; the blossoms are compound, and of a yellow colour. In order to keep a succession of young leaves for use during the summer, the plants should be cut down, and not suffered to throw up

flowering stems. It is perennial, but affords a better supply of young leaves when treated as an annual; it must be sown in drills.

Italian Corn Salad.

This new Corn Salad was received from M. Vilmorin, under the name of Mache d'Italie, and is very distinct from and superior to the Common Corn Salad, which is known in France under the simple name of Mache. This last is the Valerianella Locusta of botanists; the Italian Corn Salad is a distinct species, and called Valerianella eriocarpa. It is superior to the common Corn Salad, in the quality of its foliage, which is milder in flavour, and in coming earlier into use. The leaves are oblong, spatulate, entire, of thin texture, and a pale yellowish green colour. The principal difference in appearance between this and the Common Corn Salad is in the colour of its leaves, and the greater length of its footstalks. Besides its use in a crude state in salads, this herb, when dressed in early spring as a Spinach, is very good, and has been in much request for that purpose.

Blistered-leaved Sorrel.

This variety of garden Sorrel, Rumex Acetosa, is of French origin. It was sent to the Society by M. Vilmorin, under the name of Oseille à feuilles cloquées. Its difference from the other varieties of garden Sorrel, the Common and the Broad-leaved, consists in the surface of the leaves, which in this are blistered. The root leaves are about nine inches in length, and four inches in breadth, ovate, hastate, growing on longish footstalks; the stem leaves are more blistered than the root leaves. The flower stems are short. Its principal merit

is that it is slow in running to seed, and consequently remains longer in season for use. The leaves are only slightly acid, in comparison with those of the Common Sorrel. It is perennial, and must be increased by division of its roots; for being only a variety not permanently established, seedlings from it frequently return to the Broad-leaved, from whence it sprung.

Mountain Sorrel.

This is another useful Sorrel, which has been sent from France, under the name of Oseille vierge. It is the Rumex montanus of modern botanists, having formerly been considered as a variety of R. Acetosa. Its foliage possesses much acidity. The leaves are large, oblong, of thin texture, and a pale green colour; the root leaves are very numerous, about nine inches long, and four inches wide, being very slightly blistered. It is rather later than the common garden Sorrel in running to flower. It is propagated by dividing its roots, but may also be raised from seeds.

Green Mountain Sorrel.

An improved variety of the preceding, and preferable to any of the other Sorrels from the greater size and abundance of its leaves, which possess much acidity. It is also the latest in running to flower. It was sent to the Society from France, with the name of Oseille vierge verte lisse. The leaves are large, ovate, sagittate, from ten to eleven inches long, and nearly five inches wide, very numerous; the root leaves are slightly blistered, have long footstalks, and are a dark shining green colour. It must be propagated by dividing its roots.

Small Nasturtium.

To those who cultivate Nasturtiums in their gardens for the sake of their seed pods to pickle, this kind is preferable. The common Nasturtium, Tropæolum majus, and its dwarf variety are both runners, and require the support of stakes; without which they will extend widely over the borders. This is the Nasturtium minus of botanists, and the Capucine petite of the French. The whole plant is much smaller than the dwarf variety of T. majus, not exceeding ten or twelve inches in height, and it grows to about two feet in length. The leaves are small, with a small runner terminating each lobe. The flowers are small, of a deep golden yellow, not much expanded, the three lower petals having a blotch of scarlet at the base, the upper ones are delicately striped with the same colour towards the base, the spur is also longer than in T. majus. It flowers very abundantly. The seed vessels are rather smaller than those of T. majus.

LIST OF AUTHORS,

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MR. THOMAS ALLEN.

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List of Medals *and* Rewards, *presented by* Order *of the* Council *of the* Horticultural Society *of* London, *from May* 1, 1824, *to May* 1, 1825.

July 27th, 1824. To Mr. Robert Austin, C. M. H. S. the Silver Medal, for his attention to the Cultivation of Double Scotch Roses, the whole collection of which, raised by him, has been presented to the Garden of the Society.

July 27th, 1824. To Peter Cæsar Labouchere, Esq. F. H. S. the Silver Medal, for having introduced and encouraged the Dutch Method of Early Forcing.

July 27th, 1824. To Mr. Henry Burn, F. H. S. the Silver Medal, for having raised the Seedling Grape, called the Tottenham Park Muscat.

December 15th, 1824. To John Frederic Daniell, Esq. the Silver Medal, for his Paper on Artificial Climate, which has been printed in the Transactions.

January 19th, 1825. To Mr. George Lindley, C. M. H. S. the Silver Medal, for his Paper on a Classification of Peaches and Nectarines, which has been printed in the Transactions.

January 19th, 1825. To Mr. James Barnet, Under Gardener in the Fruit Department in the Society's Garden, Three Pounds, for the care and attention given by him in composing his Paper on Strawberries, which is printed in the Transactions.

March 24th, 1825. To John Dickson, Esq. C. M. H. S. of Rio Janeiro, the Silver Medal, for the various services rendered by him to the Society, in the assistance afforded to its Collectors, and otherwise.

LIST *of* PERSONS *to whom the* BANKSIAN MEDAL *has been presented, by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY OF LONDON, *for* EXHIBITIONS *at* GENERAL MEETINGS *of the* SOCIETY, *from May* 1, 1824, *to May* 1, 1825.

To the COMTE DE VANDES, F. H. S. for Cactus Speciosus, exhibited, May 4th, 1824.

To Mr. FREDERICK NIEMAN, for Fruits forced in the Dutch Method, exhibited June 15th, 1824.

To the Rev. THOMAS GARNIER, F. H. S. for Strawberries, exhibited July 6th, 1824.

To Mr. JOHN WILMOT, F. H. S. for Strawberries, exhibited July 6th, 1824.

To the MARQUESS OF AILESBURY, F. H. S. for the Tottenham Park Muscat Grape, a new Seedling, exhibited July 6th, 1824.

To Mr. JOHN BOWERS, C. M. H. S. for Elruge Nectarines, exhibited July 6th, 1824.

To Mr. WILLIAM LINDSAY, for various Fruits, exhibited September 7th, 1824.

To Mr. WILLIAM GREENSHIELDS, C. M. H. S. for various Fruits, exhibited September 21st, 1824.

To Mr. GEORGE WHITE, F. H. S. for Grapes, exhibited September 21st, 1824.

To Mr. EVANS JACKSON, for Highflyer Walnuts, exhibited October 5th, 1824.

To JOHN WRIGHT HULME, Esq. for Black Hamburgh Grapes, exhibited October 19th, 1824.

To Mr. THOMAS GIBBS, F. H. S. for a Collection of Apples, exhibited November 2nd, 1824.

To Mr. MICHAEL FLOY, C. M. H. S. of New York, for specimens of the Ortley Apple, sent by him and exhibited March 1st, 1825.

To ROBERT WILLIAM ST. JOHN, Esq. F. H. S. of the Island of Malta, for Maltese Oranges, exhibited March 15th, 1825.

List of MEDALS *presented by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *from May* 1, 1825, *to May* 1, 1826.

To Mr. WILLIAM GREENSHIELDS, C. M. H. S. the Silver Medal, for his Paper on the Cultivation of Pine Apples, which has been printed in the Transactions.

To Captain RICHARD CHARLTON, of the Royal Artillery, British Consul resident at the Sandwich Islands, for the services rendered by him to the Society, in the assistance afforded to Mr. JAMES McRAE, one of the Collectors of the Society, during his residence in those Islands.

To CHRISTOPHER RICHARD NUGENT, Esq. C. M. H. S. his Majesty's Consul General at Valparaiso, for the services rendered by him at different times to the Society, and particularly to Mr. JAMES McRAE, whilst resident at that place, and more especially for his successful exertions in sending alive to England, Plants of the Chilian Araucaria Pine.

List of PERSONS *to whom the* BANKSIAN MEDAL *has been presented by* ORDER *of the* COUNCIL *of the* HORTICULTURAL SOCIETY *of* LONDON, *for* EXHIBITIONS *at* GENERAL MEETINGS *of the* SOCIETY, *from May* 1, 1825, *to May* 1, 1826.

To PERRY WILLIAMS, Esq. for a White Providence Pine Apple, exhibited July 5, 1825.

To Mr. JOHNSTONE SHANNON, for an Enville Pine Apple, exhibited September 6, 1825.

To Her Royal Highness The Princess AUGUSTA SOPHIA, for Double Dahlias, exhibited September 20, 1825.

To Mr. PETER LANGELIER, for Pears, exhibited October 18, 1825.

To THOMAS CAREY PALMER, Esq. F. H. S. for Camellia Rawesiana, exhibited April 18, 1826.

LIST OF BOOKS AND OTHER ARTICLES,

PRESENTED TO THE

LIBRARY OF THE SOCIETY,

FROM MAY 1, 1824, TO MAY 1, 1825.

WITH THE NAMES OF THE DONORS.

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Mémoires de l'Académiè Royale des Sciences de l'Institut de France. Années 1819 et 1820. Tome IV. 4to. *Paris,* 1824.

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A coloured Engraving of Plectranthus ternatus, the Omime of Madagascar.

EDWARD BARNARD, Esq. F. H. S. Vice Secretary.

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HIS GRACE THE DUKE OF BEDFORD, F. H. S.

Hortus Ericæus Woburnensis, or a Catalogue of the Heaths, in the Collection of the Duke of Bedford, at Woburn Abbey, alphabetically and systematically arranged. 4to. *London*, 1825.

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Besser, Catalogus Plantarum in Horto Botanico Gymnasii Volhyniensis Cremenici cultarum. 12mo. *Cremenici*, 1816.

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M. FRANÇOIS CELS, C. M. H. S.

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MR. WILLIAM DEAN.

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M. DRAPIEZ.

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M. CHARLES FEBURIER, C. M. H. S.

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MR. MICHAEL FLOY, C. M. H. S.

A Drawing of a new Crimson Double Sweetbriar raised from seed by Mr. Floy.

THE GEOLOGICAL SOCIETY.

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JOHN GRISCOM, Esq.

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RICHARD N. HARRISON, Esq.

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Essays on various subjects of Medical Science, By David Hosack, M. D. 2 vol. 8vo. New York, 1824.

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ERRATUM.

Page 52, line 17, for *Ægyptiacum,* read *Æthiopicum.*

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